Study of Teaching Pre-school Space Creation Based on Human Perception, Experience and Imagination

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Abstract

With the development of urbanization, the optimization of stock urban space has become one of the hot issues to be explored at present. The space in front of the school, as a kind of stock space, is both a hub connecting campus space and urban environment, and a container where campus culture and social culture are mixed, therefore, the demand for regional functional compounding keeps arising. A student's architectural thinking partly comes from understanding, and the rest comes from perception, experience and imagination, the decades of development of the Buza teaching system has perfected "understanding", but experience is far from enough. Therefore, the architectural design teaching group of Hebei University of Engineering, in its fourth-year undergraduate architectural design teaching practice, explores the method of integrating and activating the space in front of the university from the trilogy of human perception, experience and imagination, stimulates students' perception and imagination, provides creative solutions to urban space contradictions, and searches for a design method and way of thinking that is both open and coherent logic.

Keywords

Pre-school space; Innovation; Architectural education; Teaching architectural design.

1. Introduction

In Leon. Creel's "Social Architecture", architectural space is considered to have a bearing capacity as well as an artistic and aesthetic tendency, which can directly influence human mental activity and perceptual capacity, and then influence human behavioral capacity and behavior patterns, while the current empirical teaching only satisfies students' basic comprehension of architectural space, including courses on architectural fundamentals, building materials, building physics, architectural aesthetics, etc., but lacks The systemic design thinking and logical design methods formed through their own perceptual experience and imagination are missing. For exploring traditional architecture, the typological, morphological, technical and experiential depths have been replaced by superficial depths, which are not suitable for the development of the times. Therefore, we can form corresponding training and research feedback through a series of pedagogical reforms to return teaching to the initial position of spatial experience and break the prejudice that the spatial field has exclusive properties. We can introduce the concept of trilogy of perception, experience and imagination in design teaching, cultivate students' perception, insight, synthesis, analysis and refining ability, etc., strengthen the refinement of symbols and attention to place, and create spatial structures and experiences with appropriate domain.

2. Existing Problems in Teaching

Through observation and analysis of the previous teaching process, the following problems were identified:

(1) Teaching method: The traditional teaching method is based on classroom lectures, supplemented by students collecting and consulting information in class, after which the design plan is gradually improved through stage sketches, computer and manual models, and each stage will be improved with the teacher's design experience, supplementing blind spots and answering doubts, this process does not fully mobilize students' subjective initiative, lacks their own perception of space and interaction with the environment, ignores the relationship between architecture This process does not fully mobilize students' initiative, lacks their own perception of space and interaction with the environment, ignores the relationship between architecture and the city, and lacks thinking about social and realistic issues in architecture.

(2) Class content: The traditional lecture content focuses on the functional organization and the choice of formal operation, based on the previous professional technique training, and the design content is completed according to the design requirements of the task book, which lacks the process of students' independent problem identification, problem analysis and problem solving, resulting in the lack of logic and innovation in the design process and results, and the basic question of "how to generate and develop design" is not addressed. The basic question of "how design is generated and developed" is not solved.

3. Opportunities for Course Selection

3.1. Subject Advantages

(1) Although the existing epidemic is well under control, epidemic prevention and control still cannot be taken lightly, and the choice of the pre-school space, with its single person, low mobility and low population density.

(2) The pre-school space has direct relevance to students and has both campus and social attributes, meeting the pedagogical requirement of guiding students to address complex functional spaces

(3), the new campus relocation, the urgent need to renew the space in front of the school, good proposals can be realized through participation in the competition to achieve the landing, the implementation of the students in the architectural design of participation.

3.2. Background of the Subject

(1) The cities of the 20th century have suffered the bitter consequences of the expansion of a single function in all its forms, as well as the confusion that has grown out of its structure, use and appearance. In particular, as education has grown in recent years, a large number of old campuses have become inadequate to meet educational needs, so that the rapid expansion of universities, renovation, expansion and new construction have become the main forms of solution. A common problem in the majority of newly formed pre-campus spaces is that they have not been planned (by the city) on a macro level, but rather the expansion of a single function has led to a serious imbalance between the centre and the surrounding area.

(2) Jan Gehl's book "Interaction and Space" discusses the behavioural characteristics of architects in considering human socialization activities in terms of their psychological needs such as a sense of domain and distance and security, as well as the "boundary effect". The book also discusses the social equity of spaces of interaction and how to remove the boundaries between different functions and populations. Compared to the literary field where the sense of separation and distance can make tragedy more colorful, the presence of distance in architecture, according to the appreciative implication, can leave us missing the perception of

architectural volumes, the ingenuity of materials and structural details, and the complete loss of an effective aesthetic experience. As an intermediary space between the campus and the city, the space in front of the campus has an important significance for the interaction between the two sides and the transmission of material energy, and the design of the space in front of the campus has become the main issue studied by the campus as well as urban planning designers at this stage.

4. Exploration of Teaching Models

4.1. Teaching Advantages

(1) The competition topics were chosen to be integrated with the architectural design course, and the competition is grounded, innovative and closely follows the development trend of the times, and fits in with the teaching concept, providing guidance for the course teaching.

(2) The theoretical foundation relies on the professional library resources of 2,863 titles and 14,803 volumes in the College of Architecture and Art of Hebei University of Engineering.

(3) The technical guarantee relies on the research equipment such as surveying and mapping tools (measuring tools, 3D point cloud scanning instruments, GPS global positioning device) and data processing equipment (high-performance desktop workstations) of the College of Architecture and Art of Hebei University of Engineering to conduct the research and ensure reliable research data and results conclusions.

(4) The school has a provincial laboratory, construction thermal engineering laboratory, construction optics laboratory, construction acoustics laboratory, simulation laboratory, GIS laboratory construction laboratory and several others to provide support.

4.2. Introduction of the Concept of Perceptual-experiential-imaginative Trilogy

In architectural discussions, the word space first appeared in German as "raum", which originally had a double meaning, encompassing both the actual physical enclosure and the abstract concept with philosophical implications. Compared to the English word "space", which is now commonly used, it is more apt to express the dual relationship between the materiality and spirituality of space. Space is both a concrete thing in the real world and a certain characteristic of human consciousness, the former can be designed and created by architects according to the measure of dimension and scale; the latter, through it, can observe and understand the world, thus realizing a new creation of diversity. Pluralism does not imply a confusion of styles, but symbolizes a respect for differences. To be annoyed by this difference that exists would on the one hand obliterate individuality, and on the other hand greatly limit democratic restrictions. It is therefore impossible to design buildings in isolation. Regardless of their size, buildings affect the world. Therefore, in teaching architecture, students are guided not to focus singularly on the function and form of the building, but to consider the volume of the building's form as a logical expression of its internal space and function, while the structural, architectural, and aesthetic unity of integrity must be maintained; they must be perceived as parts of a whole. Buildings are never neutral; they always have either a positive or negative role to play, and they are active. So contemporary architecture students in the architectural design classroom need to learn and become skilled at knowing through perception, thinking through experience, and creating through imagination in order to achieve the dual outcome of space in their design outcomes.

(1) Perception

Perception encompasses sensory perception and intuition, the direct response of objective things in the human brain through visual, auditory, tactile, olfactory, gustatory and their combined transmission stimuli forming an information re-construction activity. The quality of a good space depends on its ability to gain the recognition of the people with whom it interacts,

and the first step of recognition comes from the user's intuitive perception of it. At present, we find from previous studies that the sensory focus is largely concentrated on the visual perception of space, while neglecting other sensory experiences. Therefore, we can shift our focus from material space to spiritual space and physical space, and use different stimuli provided by the environment as design elements to create space, so that the increasingly paralyzed sensory consciousness can be activated again, promoting the development of humanized space and realizing more social needs.

In addition to traditional sensory perception, in the era of rapid development of digital creation, people have a new way to perceive space, which is to use digital construction technology to achieve real-time interaction between people and space, so that the shaped space has the flexibility and dynamics to cope with environmental changes, digital perception by information technology and sensors, and then introduce programming to form a parametric design.

(2) Experiences

The contemporary French philosopher Henri Lefebvre has pointed out in his work that space has two types, those perceived by the consciousness and those perceived by the body. We can introduce that the human scale can be the criterion of modern craftsmanship, which in turn becomes a tool for designing architecture, cities and landscapes, and that architects are no longer mere re-makers, but more often return to the rational thinking of humanizing cities and architectural spaces through objective analysis and research, changing from calm onlookers to present participants and creators of architectural atmosphere, so that modern craftsmanship can serve Our body and mind, at the same time to meet the physical needs and spiritual needs, and finally gradually transition to regeneration, to achieve the double dialogue and transformation between the abstract and the concrete.

(3) Envisage that

The development of architecture is always innovative and generally forward-looking, and the main architectural innovations of this century are not radical innovations, but rather borrowings from other disciplines, transforming concepts that can neither simply replace the established grammar, techniques, nor the essence of the architectural object. Through inappropriate use, innovations often lose their useful and even very touching function. Thus, but again, architecture as a vehicle for cultural tradition requires us to look backwards from time to time to see how the genes of tradition can be sustained in today's architecture. Just as the poet does not reflect his excellence by creating new words, quite the contrary, he uses familiar words and makes us aware of our shortcomings through special organization and poetic new ways.

4.3. Mission Statement

Contest Title Explanation.

People have always been looking for a kind of residence, from private space to public space, a comfortable spatial environment that surrounds life and nourishes the soul, from growth to old age; we have also been trying to build a bridge for people to reach their dreams with our professionalism, so that the search becomes arrival. In this era of "global village", both cities and villages have not escaped the impact of environmental degradation, rapid population growth (or loss), transportation changes, information interaction changes, and uneven economic and social development on the traditional sense of "space creation". These issues have also led designers into a constant reflection: what kind of "home" do we want for ourselves?

We live in the present, but need to plan for the future, from city managers, designers, all urban and rural construction participants, moreover, ordinary citizens who live in it, they are constantly adjusting, constantly thinking and practicing, in order to make the space we live in can be sensible without losing romance, order without losing chance, inheritance without losing development. We have perseverance, but we also embrace technology, and new

technological tools such as GIS, BIM and VR are rapidly affecting every aspect of life, driven by 5G. The competition focuses on the exploration of urban and rural habitat design under the six development concepts of heritage, technology, innovation, wisdom, ecology and sharing, and attempts to activate urban and rural spaces and create a better habitat environment through the participants' innovative and creative designs.

4.4. Teaching Phase

(1) Basic theory teaching stage

The teaching object is the fourth year architecture students, in the previous teaching process from the first year to the fourth year, they have already completed the relevant theoretical learning including the spatial combination, the principle of residential design, the principle of public design, etc. Therefore, the teacher only emphasizes the basic situation of the subject object and the complex characteristics of the base in the first two lessons at the beginning of the teaching, guiding the students in the premise of the existing reserve knowledge, based on rational thinking through their own Students are guided to discover and solve the complex problems between city, environment and architecture through their own perceptual experience based on their existing reserve knowledge, and then form their own logic of architectural space.

(2) Perception stage

Perception is not a purely visual experience; sensory pluralism not only allows for material characteristics that are not limited to the physical level, but also elicits interactive perception with the environment. The pre-campus space environment has both cultural and social attributes of the campus, which determines that teaching will transition from a single functional space instruction to a composite functional space instruction, therefore, teaching will tend to two aspects of perception: (1) material perception: different textures, colors, and materials of materials have different expressive power, which in turn affects the selection and combination of nodes and constructions, for example, wood whose overall tone favors warm tones and For example, the overall tone of wood is warm and the texture is soothing and orderly to give people a warm and intimate feeling, while steel is cold and distant with a single metallic texture. (2) Environmental perception: The environment includes the natural and social environment. Students need to understand the natural appearance and seasonal changes of the space in front of the school, and grasp the basic situation of its functional connection with the surrounding schools and residential areas, traffic connection and spatial relationship.

(3) Experience phase

The experience phase requires students to role-play and interact from the dual perspectives of residents and students, to shape the relationship between scene-character-behavior, and then to complete the image narrative of space and behavior and the place-making of space and memory to achieve participatory design. The experience includes three aspects: (1) spatial characteristics: the type, form, and combination of space is felt at the human scale, and the connection between the building monolith and the urban group is felt based on the near, middle, and far views. (2) Living Behavior: People give functional characteristics to spaces through their living behavior, and spaces influence behavior patterns through their spatial characteristics, students need to get the correlation through questionnaire visits, and express and integrate into the design through analysis. (3) Scene creation: For scene reproduction is not to mechanically extract all behavioral events into the design expression, but to take the problem as the entry point, extract the most impressive memory points, and deepen and refine the program with the actual needs of different social groups as the landing point, to create a place with a sense of identity.

(4) Imagination stage

By analysing behavioural patterns, the evolution of behavioural places and the way people socialise, as well as the potential of existing high technology, a new mode of living interaction and space is conceived by reconstructing spatial combinations and sequences, light and shade, and material characteristics with a regional cultural and contemporary character. In addition to the traditional hand-made models, the parametric representation pushes the imaginary inspiration to new heights, the students' logical thinking is sufficiently exercised, the innovation based on reason is more groundbreaking and in line with artificial intelligence, the 5G era, keeping up with the current trends.

4.5. Teaching Objectives

This design course is based on rational thinking, participatory design, role-playing and interaction by introducing a trilogy of perception, experience and imagination, to enhance students' subjective initiative and thus complete the whole process of architectural design.

5. Summary of Teaching Effectiveness and Experience

From September to December 2020, the fourth-year architecture students of Hebei University of Engineering, in conjunction with the architectural design course, participated in the competition initiated by the Steering Committee of Civil Construction of Hebei Higher Education Schools, co-organized by the Steering Committee of Design of Hebei Higher Education Schools and the Architects Branch of Hebei Civil Engineering and Architecture Society, and hosted by Jiu Yi Zhuang Chen Technology (Group) Co. (hereinafter referred to as: Jiu Yi Zhuang Chen), and jointly with the provincial higher education institutions to create the Jiu Yi Zhuang Chen Cup innovation and creativity competition for students. Under the guidance of the educational method based on the concept of human perception, experience and imagination trilogy, the submitted works achieved one first prize, one second prize and one excellent prize respectively, and three students were interviewed after the class to understand the concept of the work.

5.1. Modulo World

Liu: "The sources and inspirational ideas, respectively, the design concept, the functional layout of space, technological innovation is based on computer generation, the current era may or may not be the era of algorithms, just as Corbusier strongly advocated the machine, my ideas are mainly derived from the ant colony algorithm, for the ant colony algorithm, I am very recognized, in such a group of social creatures, we can always find commonalities, and in the search for paths I focused on going deeper and eventually finding the viability of ant colonies in cities. For the layout of the function, I consider from giving a relatively simplified perspective, from north to south,, so as to drive, or to be a model. Finally, there is the innovation of technology, assembled buildings are nothing new in today's era, but for assembled path lapping, the ant colony is an innovation, again, I will strictly adhere to the algorithm design, for the ant colony algorithm, to maintain a perfect fit."

5.2. "Born" in Nature

Zhang: "The goal of this urban design is to create an ecological urban living room, an open activity center, and a creative neighborhood that integrates business, entertainment, culture and leisure, i.e. an ecological city "born in nature". For this reason, I broke the traditional rigid and closed urban space, preserved the original village and part of the road texture of the base, implanted urban buildings with functions to coordinate with each other, and then connected the broken up space with soft curves, i.e. implanted a diffuse mesh walkway, so that the connection between building and ground, building and building is not so sharp, and at the same time pedestrians can freely stroll in this wide space covered with natural landscape. This is a

natural city in which everyone can participate. At the same time, the use of new energy sources and technologies makes the buildings more ecological, in line with the future direction of urban development."

5.3. City Rhythm Green River

Ding: "in the context of the smart city, on the basis of improving infrastructure, increase ecological greening and sports facilities, based on the theory of urban catalytic extension, proceed to build the cultural district of the university city as a vibrant neighborhood for all kinds of people, culture and common development. Based on the planning of the university campus, and the background of the development of the city to the east, the original village can no longer meet the existing functional needs of the city, so it is necessary to expand new elements to promote the local economy and industrial adaptation, to form a long-term vitality mechanism and the implantation of new elements will affect or drive the transformation and development of the original urban elements, so as to form a new city vitality neighborhood, so as to do to the culture, place, nature, the economic and other enhancements to create a cultural and living neighborhood with both sports and cultural and creative functions."

6. Summary of Results and Reflections

The introduction of the trilogy approach based on human perception, experience and imagination in architectural design teaching helps to improve students' understanding of the whole process of architectural design, to move the ivory tower architecture teaching classroom to real life, to strengthen the interaction between students and the people who use it, to focus on the social meaning of architectural projects, to break the traditional model of architectural design teaching, to use perception, experience and imagination as a comprehensive examination to select design elements This approach is a good match with the original teaching framework. This approach is a good complement to the original teaching framework, in which the improvement of the corresponding specific teaching methods still needs to be further explored in the next stage.

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