



Campus Atrium Landscape Design Based on Multi-functional Coexistence——Take Wuhan Institute of Technology as an Example

Chen Wang^(✉)

School of Art and Design, Wuhan Institute of Technology, Wuhan 430205, China
2021186233@qq.com

Abstract. The design of Campus landscape renovation is an important means to optimize the space in the campus. Recently, many studies have been conducted at domestic and abroad around the renew of campus landscape. However, it is still a valuable topic to discuss that the characteristics of campus landscape in the atrium of Liufang campus of Wuhan Institute of technology. Therefore, the specific problems of landscape design in the atrium are analysed, while relevant optimization and transformation solutions are proposed. This paper is a thematic study, and the normative research method is using during the survey, the core meaning of doing the research of campus landscape transformation idea has been demonstrated. About the current problem, a set of optimized renovation is generated by combining the design principles after comprehending some related ideas. The innovation points of this paper are reflected in the optimization of the atrium activity space, and a personal view on the transformation of the campus landscape with improvement paths is developed as well as creating an activity space with beautiful physical environment and colourful humanistic atmosphere, bring the individuality, characteristics and connotation into campus.

Keywords: Component: Campus · Atrium · Garden Landscape · Transformation Design

1 Introduction

University is an institution of higher learning that inherits, studies, integrates and innovates advanced academic knowledge, which is closely related to social economy and political system. It is the inevitable product when the development of human civilization reaches a certain stage. The school will gradually form a unique culture belonging to major colleges and universities through continuous accumulation in history and influence of the external environment. Scenery in campus shown an irreplaceable role, for example, students are motivated in their daily study and life with a beautiful campus environment and strong cultural atmosphere, which is one of the important external conditions affecting the growth of students. The art of campus landscape environment vividly expresses the spiritual outlook of the school and affects students' emotions and values imperceptibly, that is the reason why some people give a nickname to campus environment

© The Author(s) 2023

K. Subramanian et al. (Eds.): CTMCD 2022, ACSR 99, pp. 246–253, 2023.

https://doi.org/10.2991/978-94-6463-046-6_29

which called ‘invisible classroom’. Therefore, the campus landscape environment has attracted more and more attention, the advance technology in 21st century and industrialization promote the integration of education, science, technology, economic and social development. Besides, due to the rapid development of higher education industry and the continuous expansion of the scale of colleges and universities, some original campus cannot meet the latest requirements of the education and activities. The campus environment integrates the decentralized spatial pattern, creating teaching and scientific research environment with resource sharing and convenient connection characteristic, paying attention to the original ecosystem, and constructing green and healthy campus environment with ecological significance and urban characteristics under the guidance of ecological concept.

2 Design Principles

2.1 Principles of People Oriented

The idea of ‘People oriented’ design is one of the guiding ideology in the basis of campus landscape design. Thousands of teachers and students are studying and living in the campuses of major colleges and universities. Thus, we should create an environment which is suitable for the campus function and campus atmosphere required by the users for the intention of transforming and designing. ‘People oriented’ is the design idea that must be obeyed in the atrium landscape design and transformation of Liufang campus of Wuhan Institute of technology. On balance, the updating and ideal scenery of campus landscape must meet the various requirements from staffs and create a natural, beautiful, practical, positive, reasonable planning and layout and appropriate scale campus environment.

2.2 Principles of Sustainable Development

The history and development of the campus in the future must be combined in the engineering of campus landscape while refer the school’s own style. The campus landscape design maintains harmony with the existing campus landscape while innovating. According to its original cultural characteristics, I will design landscape works for Liufang campus. The new campus landscape and the original landscape will be integrated and innovated in order to make a landmark landscape witnessing the development of the University. At the same time, the landscape must be long-term and stand the test of time [1]. In the process of campus landscape design, we should understand the history of development and the future of Wuhan Institute of Technology, then creating a sustainable campus environment.

2.3 Principles of Characteristic

Colleges and universities are places with academic talents and strong cultural atmosphere, and their historical and cultural heritage is the most unique scenery. Therefore, we cannot completely separate from the conditions of the school itself, but must integrate

it into all links of landscape design in combination with its original characteristics in order to achieve characteristic campus landscape design when transforming and designing the landscape of a school. In the meantime, the designer should fully consider the needs of people, designing the whole campus environment from the aspects of psychology, environmental behaviour and ergonomics, and transform the landscape design of the atrium of the fourth teaching building under the existing technical conditions, to provide comfortable, flexible and characteristic activity space as far as possible.

3 Analysis of Land Parcel Problems

3.1 Single Plant Landscape

The configuration of plant is a highly artistic and practical technology. From an artistic point of view, there is no clear aesthetic model except the unique ecological problems and the temporal and spatial variation of plant landscape form. It is necessary to consider the collocation and setting of various plants from many aspects, as well as the adaptability of these plants to the surrounding space environment.

Starting from the function and surrounding environment, the local block has specific functional requirements for plant configuration. The space needs a certain plant configuration to reduce the impact of noise and provide a certain shading effect. Then, how to create a beautiful, anti-noise and cool environment has become a considerable valuable problem that we need pay attention. For example, achieving the goal of the exquisite layout of the plant configuration in the atrium which is conducive to the effect of streamline function, and the functional effect of scattered and coherent on the façade to protect privacy of people and distinguish public and semi-public areas. All in all, that is what we need to pay attention and consider.

3.2 Severe Homogenization

From the perspective of design enforceability, there are many existing problems in campus landscape. Most of the existing campus landscape have the same utility, especially in the lack of diversification of comprehensive activity space design. Although the concepts of Contemporary Colleges and universities are changing, there are still some universal problems in practice, such as only pursuing the aesthetic effect under the public aesthetics, ignoring the unique cultural connotation of the campus, lack of respect for the natural and humanistic environment, disconnection between landscape environment and spatial behaviour, etc. Therefore, we need to pay special attention on the impact of landscape transformation on the natural environment and respect for the humanistic environment in this project. And fully illustrate the adaptation to local conditions, including the synchronization of landscape environment and spatial behaviours which are also significant and should be improved in the campus landscape transformation design, rather than pursuing a single goal of homogenization.

3.3 The Connection of Landscape Function is Weak

A design scheme cannot exist independently in the world, its external space environment and internal landscapes are closely related to the design scheme [2]. The landscape and landscape inevitably need to be interrelated instead of jumping off each other, and forbidding separation from the overall environment. It is necessary to coordinate the relationship between internal landscape and landscape, and between internal landscape and external environment to achieve the aesthetic effect of appropriate spatial function. The spatial pattern of campus comprehensive activities is isolated from each other and less connected. The relevant traffic flow lines are unsuitable for the shuttle of staffs and students in various functional blocks, which cannot save campus land resources effectively.

Contact can be divided into two categories roughly, one of them is material connection, the other one is spiritual connection. The material connection is mainly the change and unity of materials and forms, the spiritual connection is more obscure. In the design, attention should be concentrate not only on showing the unique cultural characteristics of the specific campus landscape, but also on connecting with the surrounding cultural characteristics. The transformation of each area is unified by using materials and relevant functional links in this project to ensure that the functions of each area match the surrounding buildings and landscape, forming a complete functional zoning and how to make the traffic streamline. Furthermore, the cultural landscape like sculpture and public facilities is culturally connected with the non-transformed areas, putting the same cultural characteristics on different areas in the same campus. The designing ideal of campus activity space should be combined with the development of landscape function. The function of landscape is not only creating a beautiful environment, but also reflecting campus characteristics and culture.

3.4 Lack of Landscape Management and Maintenance

Most of the surrounding public facilities and functional landscape settings are scattered around the fourth teaching building of Liufang campus of Wuhan Institute of Technology. At the same time, some areas have low functionality and lack of using and maintenance. These problems increase difficulties to the later maintenance of the landscape. In recent years, major cities are accelerating infrastructure construction under the acceleration of urbanization, landscape is one of the important contents of ecological construction as an important part of infrastructure. Therefore, green landscape is widely used in construction projects to improve the urban ecological environment effectively in order to meet the growing environmental requirements. However, it is common that lack of maintenance after the completion of the landscape, so it is necessary to make some prediction on the future development trend of the landscape to keep the timeliness and growth of the landscape, and to reduce the burden of maintenance and maintenance.

4 Optimal Design of Space and Plant Landscaping

4.1 Learning Space Design

In general, the outdoor activity space in campus usually including dynamic and static space, which can be used not only as a semi open learning space, but also as an activity



Fig. 1. Effect drawing display of learning space.



Fig. 2. Effect drawing display of steps.

place. To optimize the campus activity space, we should improve its functionality, endow it with efficient material functions and rich spiritual functions, and combine dynamic and static, one for both purposes.

Nowadays, about the concept of ‘informal learning’, most public schools display it as supporting facilities during the period of the rapid economic development [5]. On the one hand, with the reform of teaching methods such as decentralized teaching system, community activities and autonomous learning on the university campus and the refinement of school management, the school puts forward new matching requirements for campus space. On the other hand, considering the activities of students and studying experience, there are no limitation on the format of the learning place, such as ‘English corner’, ‘literature corner’ and so on. In the contemporary university campus, our design should also constantly seek the learning space of informal learning, so as to increase the efficient use of space and the interest of learning. Creating informal learning space in the campus by developing small, scattered and local transformation.

Therefore, the atrium staircase of the fourth teaching building is selected for transformation design. The design fully uses the difference of height of the stair to transform it into scattered tables or chairs and flower beds with exquisite styles. There are several kinds of chairs such as long chairs and double or triple chairs which are useful for studying with partners or alone. About the place people can exchange ideas, there are annular tables and chairs with umbrellas on the middle platform, it is suitable for students to communicate face-to-face (Fig. 1). Creating a leisure staircase that is scattered and close to nature and can be used as a learning space on weekdays, students can sit here to read books or share learning experiences with others, or as a transportation and leisure area (Fig. 2).

4.2 Sinking Theatre Design

The outdoor activity space of university campus is an important part of campus and also a popular place for teachers and students' leisure and entertainment. The place is comfortable or not and its performance will directly affect the possibility and frequency of it be used [4]. At present, in Liufang campus of Wuhan Institute of technology, there are some deficiencies in the planning and design of places in terms of quantity, space and comfort including campus collective activity space, such as assembly place, speech competition place, small party place and so on.

Therefore, the atrium of four schools is also selected for the creation of secondary use. The atrium is a popular landscape space which is used by students frequently. It is designed and transformed by using the height difference to form a place with leisure staircase scattered and it closes to nature. Under the condition of increasingly scarce school activity places, it can be used as a leisure learning space and a theatre space on weekends, becoming a good place for cultural exchanging and activities. At the same time, this place fully satisfies the people-oriented idea, and suitable for the demands of users as far as possible from the perspective of material selection, seat height design and line of sight analysis.

From the perspective of size, according to the principle of ergonomics, the height of seat is commonly allocated in the set of 300-400mm, it includes solid and cantilever. The design fully meets the crowd activities, rest and other behaviors. From the perspective of design material, the seat is mainly made by wood with medium hardness, and the surface will be painted to prevent wood corrosion. The seat can provide a comfortable posture for people and user can get a good rest. From the perspective of the audience's line of sight, the field of vision of the audience at the top of the steps can basically cover the whole auditorium and the square, which has a good field of vision. The view analysis of the audience of the step seat in the middle of the step can include the view of the lower

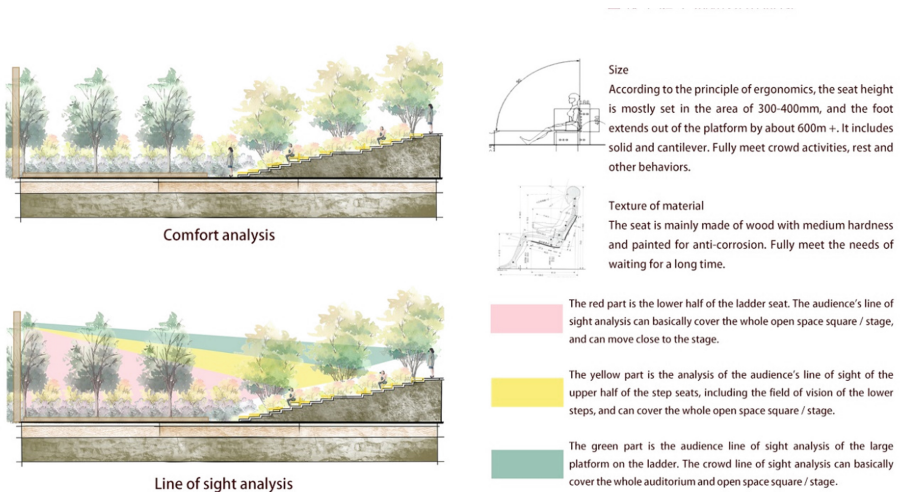


Fig. 3. Line of sight and comfort analysis.

step and cover the whole square. The seats at the bottom of the steps can basically cover the whole square without obstructions in front, and the audience can interact with the stage [3] (Fig. 3).

5 Conclusion

The design scheme is the reconstruction design of atrium campus environment landscape of the fourth teaching building of Liufang campus of Wuhan Institute of Technology.

Firstly, fully understanding the layout of the existing campus, and landscape design. And creating a different landscape reconstruction design than other schools after combining the characteristics of the school terrain.

Secondly, in the process of transformation design, we must satisfy the functional requirements of teachers and students on campus. Many research works have finished about the behaviour characteristics of teachers and students in campus space activities, as well as the needs of life, communication, learning and other aspects. Creating a humanized campus landscape space by rational planning of atrium's space landscape transformation design.

Finally, according to the unique humanistic characteristics of Wuhan Institute of Technology, the existing campus cultural landscape is screened, and the useful parts are saved and modified. Furthermore, refining planning for the specific scheme of campus landscape transformation design, and finally constructure an activity space environment with beautiful material environment and rich humanistic atmosphere, to build a personality, characteristics and connotation campus landscape environment. Inevitably, there are still some defects in the design of other landscapes on the campus. At the same time, this design may also lead to some deficiencies with the migration of time. I look forward to put better schemes and design in the future.

References

1. Han Yuxuan, Mei Yuqian Research on the concept of flexible and sustainable planning and design of university campus [J] Journal of Beihua Institute of aerospace technology, 2020,30 (05): 60–62
2. Li Li Research on the application of behavioral psychology in campus environmental landscape design [D] Nanjing Forestry University, 2007
3. Liu Qixuan, Li Yan, Li Hongju Research on the design of indoor open space in Middle School Campus -- Taking the multifunctional teaching space of Chaoyang future school affiliated to Peking University as an example [J] Art education, 2021 (02): 237–240.
4. Lu Jiwei, sun lain, Li Li Cultural Park making full use of underground space -- Urban Design of Shanghai Cultural Square [J] Journal of architecture, 2006 (07): 24–25
5. Pan Hao Research on campus landscape reconstruction based on public behavior characteristics [D] South China University of Technology, 2020

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

