

# ***Research on the Current Situation of "Heterogeneous Isomorphism" Planning Thinking in Hunan University***

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**Abstract:** Hunan University is a typical university in China with an open university campus, and every change in its development history provides an important reference basis for campus management and planning in Chinese universities. Based on the existing literature, this paper examines the historical planning of Hunan University, systematizes the planning structure and core concepts of the university, and discusses the issues based on the current situation investigation. This paper chooses to start from the chronological order of Hunan University's planning, and conducts a comparative study of the differences between the traditional "heterogeneous isomorphism" and the new situation, including the deficiencies of the university's environment and management, and the concept of heterogeneous isomorphism in the diversified environment. Moreover, correspondingly shallow suggestions are made for its shortcomings. The evolutionary model of special campuses and the problems arising from diversification are sorted out, which can provide reference and guidance for the future construction of open universities in China.

**Keywords:** Hunan University, Heterogeneous isomorphism, Campus Planning, Campus Management, Open University

## **1. Introduction**

Hunan University is a campus without school gate control in China. Its open, tolerant, and generous campus style design and planning ideas make it well-known. However, Hunan University was formerly a closed academy. Before the restructuring period from 1911 to 1926, due to feudal rule, and as one of the four major academies in China, the architectural style continued the traditional courtyard style. It is a courtyard-style brick and wood structure building complex [1]. It is composed of places such as residences, ancestral halls, and imperial study buildings. It is a Confucian axis and place with orderly hierarchy, distinct priorities, and social and ethical relationships at the same time [2]. After 1926, the academy was restructured into the Provincial Hunan University. The traditional buildings of the academy together constitute the campus. In addition, the college's educational philosophy has been changed to take into account open and inclusive ideas, allowing outsiders to enter and exit. It can be regarded as the transitional stage from a closed traditional academy to a university under the impact of foreign ideas. In 1937, Professor Liu was invited to join the Department of Civil Engineering and worked with colleges to plan and design the campus, including the complete restoration of campus buildings, campus planning and design, and campus construction [1]. There are three

important points in Professor Liu 's plan: the dissolution and reconstruction of the axis, an ideal open campus, and paying attention to the natural landforms and historical heritage [3-4].

While inheriting the historical context, it also inherits the advantages of rich educational resources and flexible learning methods of European and American open universities. Its essential planning characteristics can be summarized as "heterogeneous isomorphism", that is, maintaining the original humanistic connotation and the strengths of the public. It constitutes the characteristics of accommodating more than foothills, hiding in famous mountains, rich architecture, and a diverse campus [1]. Eventually, it developed to the point where today it can participate in the detailed planning of urban construction, participate in urban changes and major activities, and has become an important part of the Shanshui Island City.

This article analyzes the current campus planning and measures of Hunan University, points out the existing problems, and proposes the corresponding solution ideas by combining relevant literature and field investigation data. It will help to conduct a more in-depth discussion of the feasibility of open universities in China. It will also provide different perspectives on the planning structure, campus management, and development trends of China's open campuses.

## **2. Hunan University Planning Thoughts**

### **2.1. Four concentric circles**

The idea of four concentric circles is to utilize the idea of concentric circles to demarcate the functional forms of different buildings, so as to propose a planning structure that is suitable for both campus and urban planning. The concentric circle idea is also regarded as Professor Liu's pioneering openness of Hunan University [4].

The four concentric circles idea divides the university campus area into five main circles and four concentric circles. The innermost circle represents the central area of the university, including the location of the university gymnasium and sports fields, which are the areas most in need of preserving campus activities. The first concentric circle (Zone 1) outward is the teaching area, the second concentric circle (Zone 2) is the student activity area, the third concentric circle (Zone 3) is the faculty activity area, while the fourth concentric circle (Zone 4) is the Yuelu Mountain landscape area. Among them, the inner teaching and sports area also assumes the function of gathering and dispersing people to ensure normal operation of the university and gatherings activities. Between Zone 3 and Zone 4, there are many park scenic areas and small landscape nodes for faculty and students to break. The different zones are integrated with each other to form an open university environment.

### **2.2. "Heterogeneous isomorphism"**

The purpose of "heterogeneous isomorphism" itself is to focus on the integrity of the campus and the common wholeness of other non-local cultures, buildings, etc., to create a campus environment in which new and old buildings coexist harmoniously and joyfully, and to preserve the beauty while highlighting the spirit of the times [1]. Achieving "heterogeneous isomorphism" requires a consistent thought and overall framework in design, considerable skill in planning and architectural design, as well as demonstrating "national form" during the construction process [5]. "Heterogeneous isomorphism" is mainly divided into the type conversion and the architectural composite surface methods.

#### **2.2.1. Type conversion**

Type conversion is a commonly used construction method in architectural structures. The common form is form conversion in the same type. The use of repetition, deformation, separation,

superposition and other means to achieve the internal and external, virtual and real, logical image, fragmentation of the whole, and rational and romantic organic reconstruction. This kind of change itself can create a harmonious effect between new and old buildings.

### **2.2.2. Building composite surface**

Architectural composite surfaces are considered part of spatial transition and spatial integration. Meanwhile, it emphasizes the transitional layer between the building and the city, which is in harmony with the natural environment and contains human activities [1]. In the process of integrating architecture and urban environment, Hunan University makes full use of the various characteristics of the composite surface of the building (such as openness, hierarchy, etc.) to deal with the areas of "grey space", "intermediary field", and "city-school integration" so that the buildings to be separated from each other. The boundaries with the city are clearly defined while at the same time being appropriately integrated with the cityscape, etc.

## **3. New construction after 1980**

With the expansion of Hunan University in 1980, the of the original axis gradually disappeared, as well as the concept of four concentric circles was gradually diluted [2]. In the 1980 renovation plan, Hunan University retained the cultural axis that characterizes the campus and developed a second axis, the vertical teaching axis. The new axis is parallel to Yuelu Mountain, combining the old and new campuses, and is twisted around the new stadium on the south side of the campus. The whole forms a spatial sequence rich in spatial variation and linear location. With the expansion of the campus, the campus was extended to Tianma Mountain and the south, and large-scale renovation and new construction were carried out on the original basis [6]. The original core of the campus shifted southward, and the stadium and auditorium gradually moved away from the original core location of the campus. As the result, the expansion forced the concept and function of the four concentric circles to be breached in their entirety. Although this planning hierarchical concept was intentionally retained during planning, the effect was not ideal. Since then, the campus has tended to develop in a functionally integrated manner, with the concept of concentric circles has gradually blurring under the premise of more openness. The old buildings are still developed according to the layout of the circle, while the new buildings are arranged according to modern planning ideas, jointly inheriting the concept of "heterogeneous isomorphism".

## **4. Issues**

### **4.1. Planning structure**

Hunan University after 2001 to determine the campus development structure for the "one center and two axes" (Figure 1)[2]. However, center in the spatial structure and the practical significance, of the divergence. In terms of spatial structure, the intersection of the two axes is where the "center" is located. Based on the geographic location of the two axes, the "center" is located at the intersection around the stadium and covers the exit of the subway station. However, this space center has no function of distribution, it is simply the intersection of the cultural axis and the teaching axis. This is related to the fact that Hunan University itself cannot be "designed" [7], and that it is constantly colliding, connecting, and divorcing itself from the surrounding environment, to form an integrates symbiosis of existence. Therefore, it cannot be as clear as traditional planning structures. In terms of practical significance, according to the Hunan University master plan, the original center is planned to be located in Dongfanghong Square, but it is actually located in the area surrounding the center of

Yuelu Academy. Pailou Road is an important axis connecting the city's secondary roads and the main campus roads [8].

When Professor Liu was planning Hunan University, the "cultural axis" of the two axes was twisted from the Self-Inferiority Pavilion to the Aiwan Pavilion, so that the actual route of the axis passed through the north side of Dongfanghong Square. The "Teaching and Research Axis" runs from the bus station to the south gate of Hunan University. It is worth noting that due to urban planning issues, the teaching and scientific research axis has changed in a subjective sense, that is, the roads have become "heterogeneous and homogeneous". From an urban perspective, roads generally serve as urban corridors and are the easiest part to form an axis. That is, Lushan South Road, which is parallel to Yuelu Mountain, is the urban axis and ultimately runs through Dongfanghong Square and into the school. From the perspective of the Hunan University planning itself, the teaching and research axis starts from the south gate and goes straight through many teaching buildings to the intersection of Pailou Road and the urban road of Lushan Road, and continues backward to Hunan Normal University.

This layout of the relationship between the city and the school causes the city axis and the school axis to be staggered by about 200 meters, forming a situation where two "T"-shaped intersections are staggered from each other, which separates the harmony of the city and school axes. For the public, urban roads have become Z-shaped, making traffic more difficult to manage and making the campus axis difficult to detect.

#### **4.2. Landscape management**

Due to the overall mountain shape of the scenic area, visitor activity areas and visitor personnel management are concentrated, and visitors are unevenly distributed in time and space, with obvious peaks and valleys [9]. Except for seasonal crowds, In addition, the damage to the environment caused by tourists' activities, especially the impact on vegetation and water environment, is one of the important problems in the management of scenic spots. As Yuelu Mountain Scenic Area is intermingled with the university campus, this is also one of the problems of Hunan University and its coverage area. However, in terms of the management mechanism of the scenic area, Yuelu Mountain insists on using the traditional management mode of institutions, which leads to the failure of many management measures to be implemented, especially the management of campuses where universities are integrated into the scenic area. Yuelu Mountain Scenic Area fails to coordinate with colleges and universities to implement campus and scenic area visitor management, environmental testing, safety systems, passenger flow guidance, and other work.

In addition, there has been a gradual increase in the number of visitors in the form of small tour groups in recent years. Although the difficulty of crowd management has been reduced, the tourists' reliance on the management of tour guides and their lack of understanding of tourism management can lead to the development of undesirable behaviors such as roaming on small paths and over-concentration of tourists, such as congregation[9]. In addition, there is a lack of continuity and coercion in the system targeting tourism management. The tourism management system of the scenic spot is only properly enforced during the peak seasons of May and October. Since the scenic spot and the school are one and the same, it would be extremely unfriendly to the school district if a similar situation occurs on campus.

#### **4.3. Subway introduction issues**

In 2019, at the request of the Changsha Municipal Government, Metro Line 4 was established to connect the university town on the west side of Xiangjiang River and introduce Hunan University Station and Fubuhe Station to Hunan University.

Hunan University Station is located on the university campus. You can directly enter the campus space after exiting the station. However, there are not many service facilities around the station. Only Dongfanghong Square to the west can provide a large number of people. The area around Fubuhe Station is mainly occupied by teaching and research land and residential areas, with most of the supporting commercial and student apartments allocated. It is a station with rich services. However, the construction has resulted in a relatively single landscape greening around the area, chaotic shared bicycle and other non-motorized lanes, and serious road occupation [10].

The introduction of subway stations inevitably bring huge human flow and problems in management, service, evacuation, landscape and other aspects. The core area of Hunan University (from the subway station to Denggao Road Commercial Street) lacks shelter and short-term resting space, so that the nearly 200 meters of Pailou Road carries the majority of people visiting Hunan University and Yuelu Mountain. The direct introduction of the subway station into the campus increases the pressure on management and environment.

The Fubuhe subway station located on the South Campus has a wealth of commercial and supporting facilities, but the passenger flow is less than the Hunan University station. Due to the long distance between the two campuses, the South Campus is unable to undertake the function of crowd distribution. In addition, due to the flexible functional layout of the Open University, the mixed flow of people during peak hours will affect the study and life of current students [11].

#### **4.4. Outsiders and space management**

##### **4.4.1. Management of Outsiders**

Hunan University is a university open to the public, so the management of outsiders needs to be adapted to the huge flow of people and remain efficient over time. Currently, the management of outsiders on campus is limited to guidance and the designation of restricted areas within buildings through measures such as access control, a method that fails to effectively decentralize and manage the flow of people. Although Denggao Road Commercial Street is used as one of the measures to evacuate tourists, Denggao Road is both a living area for students and a tourist area for tourists, as well as a supporting environment area for scenic spots, which determines its urban positioning as a highly managed and important landscape road [12], which assumes the corresponding supporting functions while guiding tourists, and is unable to serve as a mainstream evacuation method for tourists on the Hunan University campus. Moreover, there are no other types of people management measures other than people guiding and traffic restriction.

##### **4.4.2. Space management**

Hunan University upholds an open mind, most of its spaces present the architectural style of an enclosed courtyard [3]. Most of the inner court spaces can be well managed through access control. Regarding the spatial activities outside the building, everyone at Hunan University can access and participate in them. Therefore, the external space can be said to be a relatively free and unrestricted urban space. Therefore, under the premise of rational spatial planning of Hunan University, people need to be guided to the correct use and allocation of space. Small spaces can be managed through access control, but large spaces lack management measures.

#### **5. Suggestions**

The core "heterogeneity isomorphism" serves as the cornerstone of the rich and colorful campus environment of Hunan University today, and it should continue to be passed down as a spiritual civilization. The problems faced by the campus management of Hunan University today are

management and construction problems faced by all cities. However, the theme venue is a relatively special functional area of the university and needs to deal with a more mixed group of people and management measures. Hunan University itself can inherit its cultural heritage through tangible buildings. In the process of continuous construction, transformation, and expansion of the city, regardless of style changes and functional variations, its spiritual civilization is still a unified concept of "heterogeneous isomorphism" [1]. Participate in urban planning, urban construction, and urban management in a harmonious but different manner, and use such measures to demonstrate the spirit of freedom of the university. By continuously retaining the architectural, cultural, and humanistic elements of various historical periods, we will build the spiritual home of "Hunan University" as a university.

The management model of "small opening and large closing" can be adopted to provide high-quality campus environment, green environment, and open space to the surrounding areas in the process of integrating into the city. At the same time, we insist on closed management of teaching buildings, office buildings, and apartments, so as to be visible but not obstructive. Greenery and trees will replace physical walls, share resources with the city, and regularly open libraries, auditoriums, museums, etc. in accordance with the wishes of the people [13]. The university needs to form a complete closed-loop business service and public service activities [14].

In addition, traffic and crowds can be further guided. The commercial evacuation of Denggao Road is a very successful example. Considering that a commercial street has limited functions, the crowd can be redirected to the Xiangjiang River, which has lost some of its popularity due to the introduction of the subway. At the same time, it can also Enrich the block functions and benefits brought by Taozi Lake and Tianma Mountain.

## 6. Conclusion

After more than a hundred years of development, Hunan University has made relatively complete explorations in planning structure, architectural form, urban integration, etc., and has summarized the development themes of "heterogeneous isomorphism" and "one center, two axes" in its planning.

"Heterogeneous isomorphism" is the core of architectural planning, aiming at campus expansion, functional variation, and style changes, but its spiritual core is still unified. The unique openness needs to be integrated into urban planning. Changes on campus often mean changes in the city. In addition, Hunan University itself is also an attraction open to the outside world, and the management level is also more complicated. From the perspective of the school, the problems solved by the integration of school buildings of different natures into traditional Chinese cities can serve as a reference precedent for the opening up of Chinese universities in the future. In terms of the nature of the city, the urban planning and management techniques used successfully in small-scale "heterogeneous isomorphism" will definitely solve the problems caused by the integration of various factors in large cities.

However, this article has shortcomings. Although this study tried its best to find relevant information, there is still the problem of incomplete information. In addition, this article mainly evaluates its rationality from a planning perspective, lacking analysis from a management and landscape perspective.

## References

- [1] Wei, C., Xu, H., & Lu, J. *Heterogeneity and Isomorphism—From Yuelu Academy to Hunan University* [J]. *Architectural Journal*, 2012, (03):6-12.
- [2] Yuan, C., Hu, F., & Wang, X. *Diachronicity and Synchronicity—Taking the evolution of campus space of Hunan University as an example* [J]. *Huazhong Architecture*, 2020, 38(07):69-72. DOI:10.13942/j.cnki.hzjz.2020.07.015

- [3] Ding, G., Yan, B., & Liu, S. *Liu Shiyong's exploration of urban planning practice and its contemporary inspiration* [J]. *Urban Studies*, 2022, 29(07):13-21+29.
- [4] Chen, S. *Research on Liu Shiyong's Thoughts on Education and Planning*[D]. Hunan University, 2020. DOI:10.27135/d.cnki.ghudu.2020.003693
- [5] Liu, S., & Xiao, C. *The early buildings of Hunan University—understand the history of modern Chinese architecture from here* [J]. *Chinese and Overseas Architecture*, 2021,(06):42-47. DOI:10.19940/j.cnki.1008-0422.2021.06.008
- [6] Bi, L.,. *Regional thinking from an urban perspective—taking the campus planning and architectural design of Hunan University as an example* [J]. *Henan Building Materials*, 2013, (02):199-201. DOI:10.16053/j.cnki.hnjc.2013.02.033
- [7] Wei, C., Huang, B., Li, X., & Song, M. *The Semantics of Place: From Functional Relationship to Structural Relationship—Planning and Architectural Design of Tianma New Campus of Hunan University* [J].*Architectural Journal*,2018,(11):
- [8] Zhou, H., & Jin, F. *The application of TOD in open university campus planning—Taking Hunan University as an example* [J].*Chinese and Overseas Architecture*, 2011,(01):85-86.
- [9] Liu, S., .*Research on optimization of tourist management in Yuelu Mountain Scenic Area* [D]. Xiangtan University, 2008.
- [10] Wang, X. *Research on evaluation and optimization strategies of pedestrian space in Yuelushan University Town subway station area* [D]. Hunan University, 2020. DOI:10.27135/d.cnki.ghudu.2020.004061.
- [11] Yi, Q., & Xiao, Q. *A brief analysis of the planning characteristics of China's open universities—taking the South Campus of Hunan University as an example* [J].*Doors & Windows*, 2013,(04):392.
- [12] Qin, S., Zhu, P., Deng, C., Gao, Y., & Liu, H. *Research on the differentiation of commercial streets around universities from the perspective of new institutional economics—taking Hunan Normal University and Hunan University Headquarters as examples* [J]. *Areal Research and Development*, 2016,35(02):77-83.
- [13] Zong, H.,*Research on the relationship between Yuelushan University Town campus and surrounding environment from the perspective of urban dual cultivation* [D]. Hunan University, 2021. DOI:10.27135/d.cnki.ghudu.2021.004243
- [14] Liu, H. *Research on the spatial distribution of service facilities in universities under the background of closed management*[C], *Urban Planning Society of China, Conference Proceedings in 2022 Annual national planning conference*, Huazhong University of Science and Technology. 2023, DOI:10.26914/c.cnkihy.2023.042777.