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Incorporating Chinese Aesthetics in University Campus Designs: Analysis from Traditional to Contemporary Models of Chinese University Campuses

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Abstract

The evolution of higher education institutions in China has significantly mirrored the nation's rapid development and cultural recovery, particularly through the architectural transformation of university campuses. Originally modeled on European and American paradigms in the late 19th and early 20th centuries, the Chinese universities such as Tsinghua University, Peking University and Wuhan University have undergone a considerable paradigm shift toward incorporating traditional Chinese architectural aesthetics and cultural elements. Newly established Sino-foreign cooperative universities were designed employing cutting-edge aesthetics construction technologies; however, this advancement may compromise the preservation of traditional cultural elements and architectural features that are characteristic of Chinese design. This study analyzes the architectural and cultural evolution of selected Chinese university campuses, including historical exemplars and newly established Sino-foreign universities, to explore the integration of traditional design features. The research employs qualitative methods, including architectural analysis and literature review. Key research questions address the specific architectural features of traditional campuses and the Sino-foreign institutions that symbolize elements of Chinese culture. Findings of this paper reveal a dynamic interplay between tradition and modernity. Ultimately, this study offers insights and recommendations for the future development of Chinese university campuses, emphasizing the importance of aesthetics and cultural elements balancing cultural heritage with contemporary educational frameworks.

Keywords: *Chinese University Campuses; Campus Design; Sino-Foreign Cooperative Universities; Traditional Chinese Architecture, Aesthetics.*

1. Introduction

Over the past decades, the evolution of higher education institutions in China has mirrored the nation's rapid development and cultural revitalization. Notably, Chinese university campuses, have undergone substantial transformation, incorporating traditional Chinese architectural aesthetics and cultural elements into their infrastructure. This phenomenon provides a convincing narrative of adaptation and cultural synthesis within the domain Chinese of higher education.

Most Chinese universities were initially established during the late 19th and early 20th centuries have certain influence from Western educational models and architectural designs, ; when China endeavored to modernize and adopt Western educational systems (Dong, 2023). Institutions such as Tsinghua University in Beijing and Fudan University in Shanghai were constructed with layouts and architectural styles reminiscent of their Western counterparts, represent principles of symmetry, classical designs, and functional educational spaces (Hong, 2020). However, new Sino-foreign university campuses were losing their unique Chinese harmony in decorating aesthetics and cultural elements.

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As China embarked on its path of cultural renaissance and modernization in the latter part of the 20th century, a deliberate effort was made to integrate native cultural elements into the architectural aesthetics and cultural models of these institutions. This transformation aimed not only to redefine the aesthetic identity of the campuses but also to create environments that resonate with the Chinese cultural heritage and educational philosophies. The unique path of Chinese development, rooted in the enduring principles of Confucianism and the broader traditions of Oriental philosophy, offers a compelling alternative to the Western models of progress. By emphasizing ethical and moral development, the integration of aesthetics and cultural elements, and the creation of environments conducive to ethical cultivation and reflection, Chinese university campuses hold valuable lessons for the global community (Chang, 2019).

Amid rapid economic and technological advancement, the ability of Chinese universities to uphold their distinctive traditional culture and identity is a multifaceted substance. When considering the example of Chinese classical university campuses, their traditional architectural style and serene environments indeed offer insight into a model for the construction of new university campuses within their aesthetics and cultural elements together with unique traditions of construction (Chang, 2019). Nonetheless, achieving a harmonious balance between aesthetics, traditional cultural elements and modern educational needs, requiring thoughtful consideration. This research attempts to analyze the Chinese university campuses through the lens of their architectural aesthetics and cultural evolution. It seeks to answer the following questions: (1) What are the distinctive architectural aesthetic characteristics of traditional Chinese university campuses, which were initially modelled on European and American styles? (2) What are the recent Chinese-foreign university campuses being built, and how do they incorporate elements of Chinese culture in architectural aesthetics?

This study explores the infrastructural transitions of these campuses, examining the incorporation of traditional Chinese elements such as courtyards, pavilions, integration with natural landscapes, and symbolic architectural aesthetics forms into modern educational facilities.

Through an examination of selected case studies of prominent Chinese universities, such as Tsinghua University; Peking University and Wuhan University; newly established Sino - foreign cooperative universities such as University of Nottingham Ningbo and Xian Jiaotong University Liverpool) this research will explore and analyses the trajectory of infrastructural transformations, elucidating the methods and principles underlying the combination of Western and Chinese architectural styles. It aims to provide insights into how these campuses reflect China's broader socio-cultural shifts and aspirations, reinforcing architectural aesthetics; a sense of national identity while adhering to global higher educational standards and values.

Ultimately, this paper seeks to contribute to the understanding of how spatial and architectural aesthetics practices in Chinese university campuses serve as a microcosm of the country's dynamic interplay between tradition and modernity. This paper further studies the significance of these architectural aesthetics transformations in fostering environments that support academic excellence and cultivate a profound appreciation of Chinese cultural heritage among students and scholars. The article concludes with recommendations in the development of Chinese university campuses, including but not limited to Sino-foreign cooperative institutions.

2. Data and methods

Drawing on a qualitative research approach, this study analyzes selected case studies of selected Chinese universities to assess the architectural and cultural evolution of their campuses. This research adopts a qualitative methodology to explore the architectural aesthetics and cultural evolution of Chinese university campuses, particularly in the context of their historical developments and recent transformations. The study employs a multifaceted analytical approach, combining architectural aesthetics analysis, document review, and field observations to ensure a comprehensive understanding of the nuances involved in the design and transformation of these educational spaces.

It is based on multiple complementary data collection methods to enrich the understanding of architectural aesthetics and cultural transitions in Chinese universities involving a systematic examination of the physical characteristics of the campuses, including an assessment of layout, material use, architectural styles, and landscaping.

The data was collected from different journals, books, reports and internet sources related to the study. The website scholar.google.com was used to search for pertinent literature. In order to find relevant articles dedicated to the field of study relevant keywords were used: “Chinese university campuses”; “Chinese aesthetics in architecture”; “Chinese cultural elements in architecture”. The data was collected from the websites of Chinese universities - Tsinghua University; Peking University; Wuhan University and Sino - Foreign cooperative universities such as University of Nottingham Ningbo and Xian Jiaotong University Liverpool). The findings are to allow comparisons between traditional and modern campuses, examining how architectural features embody cultural values and educational philosophies over time. The final selection of literature for review was based on the following parameters: a) number of citations; b) relevance to the higher education context; c) originality of approach.

3. Results and Discussions

University campus in China

As stated earlier that the Chinese university campuses were influenced by European and American architectural aesthetics paradigms, particularly noticeable in the late 19th and early 20th centuries. During this period, institutions such as Tsinghua University and Fudan University were modeled with Western layouts emphasizing symmetry, classical designs, and operational areas. This Western influence aimed to modernize education systems and practices. In the late 20th century, Tsinghua University began incorporating traditional Chinese architectural aesthetics elements into its infrastructure, signaling a renewed emphasis on cultural heritage amidst continued global influence in higher education. Generally, in 1930th Christian universities in China spearheaded the promotion of a novel fusion of Chinese and Western architectural aesthetics styles against a unique historical backdrop (Hong, 2020). This movement laid the groundwork for the resurgence of traditional Chinese architectural art, representing a symbolic affirmation of Chinese cultural heritage during a period of growing national consciousness (Dong, 2023).

This period of transformation reflects China's cultural renaissance, where educational spaces were redesigned to resonate with Chinese architectural aesthetic principles, such as courtyards, pavilions, and integration with natural landscapes, while still adhering to functional and modern educational needs.

This paradigm shift aimed not only to redefine aesthetic identities but also to resonate with Chinese cultural heritage and philosophies such as Confucianism and Oriental traditions. Impact to this field was done by Henry Murphy, American architect and designer. His work in China combines Western technologies and Chinese stylistic features under his adaptive architectural approach. In a research article Yan Hong articulates an opinion on the necessity of studying American-style campus planning and the corresponding influence on the development of Chinese campuses.

One of the most notable designs and planning of the university campus in China was made by Henry Murphy for Tsinghua campus. Initially, the college was designed to prepare students for advanced studies in the United States, reflecting a significant Western influence in its educational model and architectural aesthetics design.

In contrast to the common approach of many foreign architects who worked in China, Murphy expressed a viewpoint where he perceived the architecture of China as a "living organism," as opposed to treating it solely as an archeological artifact or a source of ornament for integration

into foreign architectural designs (Hong, 2020). He endeavored to revitalize distinct forms of Chinese architecture, leveraging their application to address contemporary practical challenges. One such instance involved the planning of missionary colleges, where he sought to integrate traditional Chinese architectural forms with modern building materials and techniques, such as steel beams and reinforced concrete, which were gaining prominence in North American architectural practices during the 1910s but were relatively novel within the Chinese context.

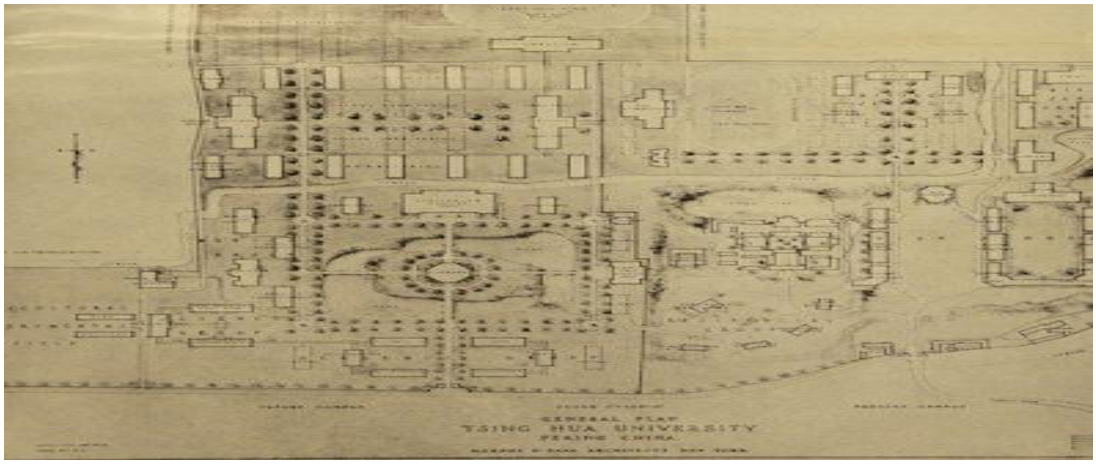

Fig.1 Henry Murphy's master plan of Tsinghua University

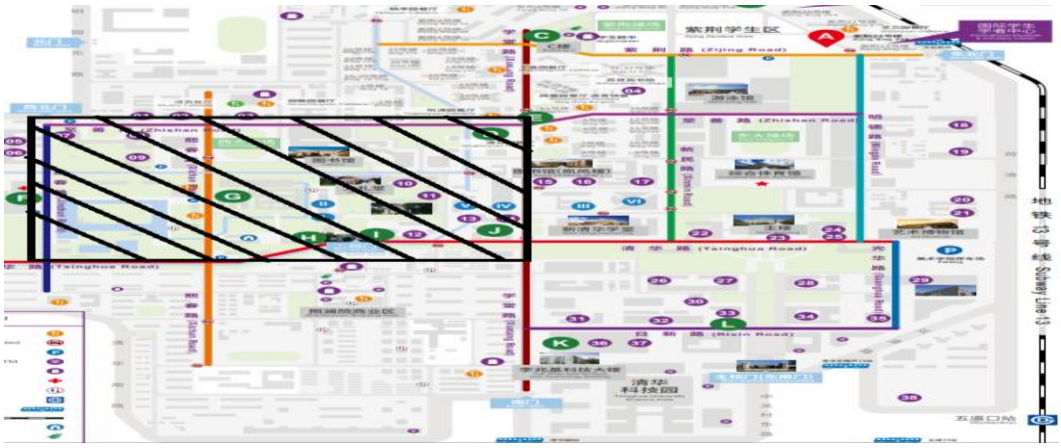

Fig.2 Tsinghua University part of Henry Murphy's master plan 1910s

Fig. 3 Tsinghua University recreation zones

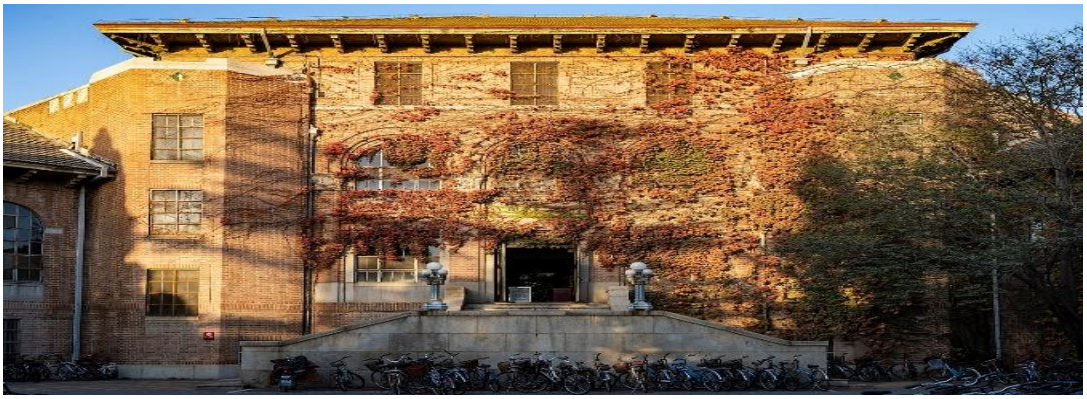

Fig.4 Old library

From the outset, Henry Murphy initiated a total of five university projects, with Tsinghua University standing out as one of the principal endeavors. From its foundation, the architectural blueprint of Tsinghua University signifies a resemblance to Western universities, emphasizing symmetry, classical designs, and functional educational spaces. This Westernization was a part of China's broader effort to modernize and reform its education system following the late 19th and early 20th century interactions with Western powers.

Notable points of comparison are the construction techniques of Western and Chinese roofs, as well as timber arches. Henry Murphy's work in China represents a blend of Western technologies and Chinese stylistic elements within his adaptive architectural aesthetics approach. He developed the triangulated truss, a rigid construction method that limits expansion, while China's beam frame system, not reliant on triangles above the column level, allows for significant expansion in all directions. (Yan Hong, 2020).

The architectural aesthetics legacy of China's Christian universities and the subsequent revival of traditional Chinese architectural art serve as compelling historical testimony to the dynamic exchange between Chinese and Western cultures, as well as the intricate interplay of globalization and localization within the context of glocalization at these institutions (Dong, 2023).

The Case of the University of Wuhan

During the construction of Wuhan University's campus in the early Republic of China (1929-1937) special traditional Chinese elements in its architectural aesthetics design were exhibited. The campus was built by the American architect F.H.Kales, professor from Massachusetts Institute of Technology. Kale meticulously designed the campus layout, focusing on elements that harmonized both Western architectural principles and traditional Chinese architectural features. His innovative approach included the integration of concentric circles, adaptability, and exploration of Chinese memorial buildings within the campus space (Tong, Tang, & Li, 2020).

Fig.5 Old library in Wuhan

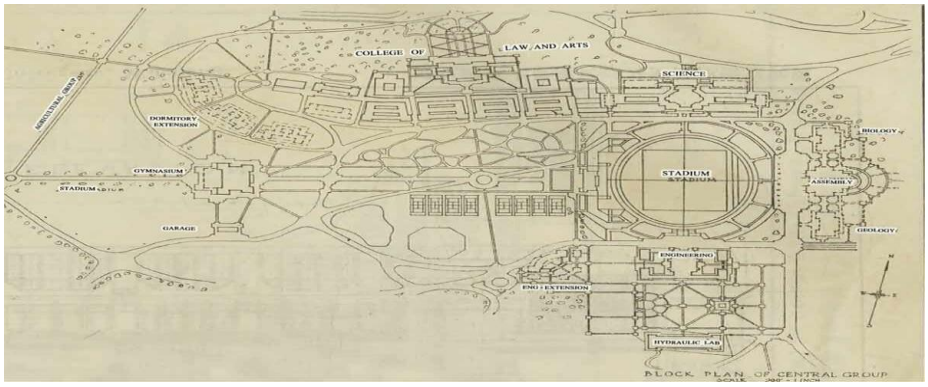

Fig. 6 Final plan of Wuhan campus

Moreover, Kales' deep involvement in the campus planning process led to the incorporation of Chinese traditional memorial architecture elements into the overall design. By working closely with Chinese architect Poy Gum Lee, Kales further enriched the campus layout by highlighting the etiquette and cultural heritage of the Wuhan University space through the placement of key buildings and structures along the central axis, the implementation of radial and square road systems, the integration of pure geometric structures, and the utilization of a modern baroque style in the campus road planning (Askar et al., 2022).

The Case of Peking University

Peking University, established in 1898 on the former Yanjing University site, stands as one of China's most revered higher education institutions, as indicated by global QS Rankings and scholarly sources/references. Over a span of more than a century, the university has undergone significant transformation, culminating in the development of an expansive urban campus covering an area of 339 hectares by 2011. Notably, the campus layout transitioned from a mono-axis style to a multi-core design. Furthermore, substantial construction efforts in the 1950s, along with the establishment of library and scientific facilities in the 1970s and 1980s, notably enhanced the functional aspects of the campus. The early 2000s witnessed the realization of several pivotal projects at PKU, including the construction of a new library and the Centennial Memorial Hall, signifying a notable resurgence in the campus development landscape.

Fig. 7 Langrun garden

Fig. 8 Campus of BiMBA is located in Langrun garden

The specific Chinese architectural aesthetics elements integrated into the Peking University campus include traditional-style buildings characterized by sloped roofs covered with crimson tiles, ornate lattice windows, symbolic motifs such as stone lions and dragon carvings, and traditional archways. The architectural design also incorporates intricately carved woodwork, classical gardens, and the use of red brick, a staple material in historical Chinese buildings. These elements collectively contribute to the campus's ambiance, that promote Chinese cultural heritage within the modern academic architectural aesthetics setting. (Zhang & Zhang, 2022).

In traditional Chinese architectural culture, the "pagoda" serves as a systematic landmark and often acts as a focal point for emotional connections. The design of these structures adheres to traditional principles, with the stage's location determining the building's highest point while adjacent areas gradually descend, allowing the highest space—the stage—to dominate the overall form. Additionally, the centripetal square provides a psychological and spiritual center for students and faculty members, functioning as a communication hub for individuals from diverse socio-economic backgrounds.

Sino-foreign universities in China

The establishment of university campuses in China following American and European models has been instrumental in promoting collaboration between foreign and Chinese universities, thereby contributing to the internationalization of Chinese higher education. This strategic approach is exemplified through the creation of joint campuses, highlighting China's evolving policy of openness and its efforts to enhance mutual understanding with Western educational systems. Foreign universities playing a significant role in shaping collaborative ventures with Chinese institutions have further contributed to this trend by fostering an environment of openness and understanding between China and the West. Consequently, Chinese universities are adapting and becoming more receptive to Western educational models, signaling a noteworthy shift in the approach to academic alliances and international educational collaboration.

Similar systems are considered in the construction of new Sino-foreign cooperative universities. The renaissance of traditional Chinese architectural aesthetics art in academic spaces stands as a compelling testament to China's rich heritage in the face of evolving global influences, underscoring the importance of preserving cultural identity amidst modernization (Ma, Jieming & Li, Chili & Gu, Minmin,2019). Thus, the Sino-cooperative universities are a prevalent trend in China, representing a novel form of higher education. This model involves collaborations between foreign and Chinese educational institutions to establish projects or institutions within China, primarily catering to the educational needs of Chinese citizens. Furthermore, the establishment of Sino-foreign cooperative universities serves as a notable aspect of higher education internationalization and the contemporary university landscape. (Ma, Jieming & Li, Chili & Gu, Minmin,2019).

The architectural design of Sino-Foreign Cooperative Universities is characterized by a striking blend of modernity and tradition. Renowned architects are often influenced by the principles of Western design open spaces, functional structures, and innovative materials—while also incorporating Chinese cultural motifs. This duality reflects China's commitment to advancing its educational facilities without losing sight of its rich heritage.

In contemporary times, the approach towards 20th-century architectural aesthetics legacy has evolved noticeably since the 20th century, as China's architectural sphere increasingly recognized a diminishing temporal gap between China and the Western world. If the crux of Western modernist architecture entails a profound reevaluation of tradition, transcending national frontiers, and epitomizing 'cosmopolitanism,' augmented by today's integration of virtualization technology and an affinity for nostalgia and transformation, Chinese contemporary architecture, when confronted with a dominant foreign influence, traversed phases from initial rejection through an emphasis on tradition to blind emulation of Western paradigms to avoid lagging behind, culminating in localized explorations grounded on a globally embraced modern framework. It stands to reason that amidst the dominance of national identities and cultural distinctions, the ensuing architectural expressions may find it challenging to elude the constraints of cultural diversity and ideological influence, even in the digital age (Hong, 2020).

The Case of the University of Nottingham Ningbo

Founded in 2004, the University of Nottingham Ningbo was the first Sino-Foreign Cooperative University in China, initiated through a partnership between the University of Nottingham in the UK and the Ningbo Municipal Government. The establishment of UNNC was a part of China's broader strategy to internationalize higher education.

The architectural vision for the UNNC campus was brought to life by the renowned architectural firm Rogers Stirk Harbour + Partners, known for their innovative and sustainable designs. The firm's co-founder, Richard Rogers, is an award-winning architect celebrated for his work that often combines modern functionality with sensitivity to cultural context.

One of the most striking aspects of the UNNC campus is its harmonious integration with the natural landscape. The site features numerous gardens and water features, which are quintessential elements of traditional Chinese architecture. These spaces are designed to evoke tranquility and promote mindfulness among students. UNNC's buildings incorporate specific architectural elements that pay homage to traditional Chinese styles. For instance, the rooftops of several structures exhibit a slight curvature, reminiscent of ancient pagodas. This design choice connects the campus visually to its cultural roots while maintaining a modern twist suitable for academic facilities.

Fig.9 University of Nottingham Ningbo - University plan

Fig. 10 University of Nottingham Ningbo

The ongoing integration of cultural elements into the campus design serves to enhance the higher educational experience, preparing students to thrive in an increasingly interconnected world. This synthesis of tradition and modernity exemplifies how architectural aesthetics can embody educational ideals while celebrating cultural heritage.

The Case of Xi'an Jiaotong Liverpool University

Founded in 2006 through a partnership between Xi'an Jiaotong Liverpool University, one of China's most prestigious institutions, and the University of Liverpool in the UK, XJTLU has rapidly gained recognition for its innovative approach to higher education. This partnership emerged from a vision to create a world-class educational institution that could nurture global talent and foster academic excellence.

Construction of the university's campus in Suzhou commenced in 2005, following the signing of a cooperative agreement between the two universities in 2004. The campus was designed to reflect both the advanced pedagogical methodologies employed by the University of Liverpool and the cultural values and architectural traditions of China.

Xi'an Jiaotong-Liverpool University (XJTLU), established in 2006 through a collaboration between Xi'an Jiaotong University and the University of Liverpool, is situated in Suzhou, Jiangsu Province, China. The XJTLU campus occupies a strategic location in the Suzhou Industrial Park, a hub for technological innovation and educational development. The campus is meticulously planned, promoting an atmosphere conducive to learning, collaboration, and cultural exchange.

The university campus is characterized by open spaces, landscaped gardens, and strategically designed buildings that facilitate both academic and social interactions. The campus design emphasizes walkability, with pathways connecting various academic and residential buildings.

At the heart of the campus, the central courtyard serves as a communal space for students and faculty. This area is designed to encourage interaction and informal gatherings, reflecting the traditional Chinese architectural practice of using courtyards as social spaces.

Fig.11 Xi'an Jiaotong Liverpool University - University plan

Fig. 12 Xi'an Jiaotong Liverpool University campus

The architectural of the academic buildings is characterized by a modern aesthetic complemented by traditional Chinese design elements. Buildings on campus seamlessly blend modern architectural techniques with elements such as upturned eaves, which are characteristic of traditional Chinese architecture. The use of upturned eaves and traditional facade treatments not only enhances the visual appeal but also pays homage to China's architectural heritage. These structures provide state-of-the-art facilities for teaching and research, satisfying the needs of a contemporary educational institution.

The integration of gardens and water features throughout the campus aligns with the principles of feng shui, emphasizing harmony between the built environment and nature. Dedicated cultural and exhibition spaces are incorporated into the campus design to foster cultural exchange and artistic expression. The campus incorporates sustainable practices in architecture, including energy-efficient systems, water conservation strategies, and the use of environmentally friendly materials. The inclusion of these modern elements is balanced with traditional landscaping, illustrating an innovative approach to sustainability that respects cultural context.

The architectural design of XJTLU was developed by AEDAS, a global architectural firm known for its commitment to innovative design and sustainable practices. The firm’s design philosophy emphasizes the 'sense of place,' a concept deeply rooted in understanding the cultural and historical context of an environment. In the case of XJTLU, this principle manifests in the careful integration of Chinese architectural motifs with modern design features.

Xi'an Jiaotong-Liverpool University exemplifies a successful model of Sino-Foreign higher education, effectively incorporating traditional Chinese elements into its architectural design while embracing contemporary educational practices. The campus configuration promotes an engaging

academic environment that respects cultural heritage and fosters intercultural communication. By harmoniously blending modern architecture with traditional aesthetics, XJTLU not only enhances its educational mission but also contributes to the cultural landscape of China, serving as a model for future Sino-Foreign collaborations in higher education.

The thoughtful integration of cultural elements within the university's architecture underscores the significance in educational environments, demonstrating how traditional values can coexist with modern educational demands. This approach contributes to the formation of a uniquely globalized educational experience anchored in local culture, ultimately preparing students for success in a diverse world.

4. Conclusion

The architectural and cultural evolution observed in Chinese university campuses acts as a microcosm of the intricate interplay between tradition and aesthetics modernity within the nation. These changes underscore the significance of establishing environments that not just enable academic excellence but also nurture a profound comprehension and reverence for Chinese cultural heritage among both students and scholars. The insights gleaned from Chinese universities bear substantial relevance for nations globally, highlighting the seamless merging of tradition and modernity in educational infrastructure as an embodiment of local and global ideals.

Architectural change leads to the ignoring of certain cultural values and characteristics in the construction of new university campuses with modern aesthetics. These new educational institutions tend to omit elements such as traditional Chinese commemorative architecture, radial and square street systems, concentric circles, and modern baroque styles representative of the early Republic of China. The decision to emphasize modern architectural standards often results in the omission of upturned eaves, traditional façade treatments and the seamless blending of modern architectural techniques with traditional Chinese design elements. In addition, the prominence of open spaces, landscaped gardens, and water features.

It is also worth noting that the development of Chinese university campuses has undergone a notable transformation, reflecting a dynamic synthesis of traditional Chinese architectural aesthetics and cultural values with modern educational needs. This has resulted in a compelling narrative of adaptation and cultural amalgamation within higher education, effectively bridging tradition with necessary modernization. Initially influenced by Western architectural paradigms, Chinese university campuses have progressively integrated traditional elements such as courtyards, pavilions, and symbolic architectural forms, successfully resonating with Chinese cultural heritage and educational philosophies while maintaining global higher educational standards.

Conversely, the newer Sino-foreign cooperative universities, chiefly targeting the educational needs of Chinese citizens, display a more modern architectural design approach with limited incorporation of traditional Chinese elements. This marks a notable departure from the extensive integration of traditional Chinese architectural aesthetics observed in Chinese university campuses, characterizing a distinct trajectory within these more recently established institutions.

As vital centres for cultural inheritance in China, university campuses have served as repositories of knowledge passed down through generations. The introduction of modern architecture within a traditional campus setting significantly influences the overall enhancement of the educational environment. During the research-based design discussion, the authors recommend the following strategies to address the challenges posed by modern aesthetic constructions within traditional campus contexts to attract more students and faculty:

1. Incorporation of design university buildings to reflect traditional Chinese architectural styles, such as the use of curved roofs, wooden structures, and intricate ornamental designs. This will

not only honour cultural heritage but also create a visually cohesive campus environment that resonates with historical significance.

2. Optimize and integrate the functions of diverse spaces, along with various natural elements, to create multifunctional areas within university buildings. This approach aims to generate "functional value-added effects" and facilitate the efficient operation of architectural designs.

3. Incorporate both open and enclosed spaces to promote social interaction and learning opportunities. It is essential to consider the flexible and sustainable development of these spaces over the long term.

4. Develop growth-oriented campus environments that encourage sustainable practices and foster interaction between architectural structures and their occupants.

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