The Impact of Campus Space on Teacher-Student Social Behaviour: A Comparative Study of Shanxi Yuci No.2 Middle School and UCL Academy

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Abstract: This paper explores spatial differences in campus design and their impact on teacher-student social behaviour, using Space Syntax theory as a framework. School buildings in China are characterized by a strong programme that emphasizes collectivism, order, and functionality, featuring symmetrical layouts and clear boundaries. In contrast, British school buildings prioritize individuality and innovation, with flexible layouts and dispersed functional spaces that encourage outdoor activities and social interaction, fostering independence and creativity. These differences reflect the cultural values and educational philosophies of China and the UK, significantly influencing social behaviour. This paper examines the distinct architectural styles and internal organisation of school buildings in China and the UK through a case study of Shanxi Yuci No.2 Middle School and UCL Academy. By studying these two school cases, this research explores how different educational environments shape teaching methods and student behaviour, providing insights for school design and educational practice.
***Keywords*:** school buildings; cultural differences; spatial layout; space syntax

1. Introduction

Studying the impact of spatial structure and layout in school buildings on education and social organization is crucial, as students spend much time on campus. Thomas Markus (1993) emphasized that schools shape society by linking education with design. They serve as places for knowledge transmission and environments for students to learn social norms, engage in interactions, and develop moral values, playing a vital role in the socialization process.

Layout and configuration influence individuals' control and accessibility, with some areas being more controlled than others (Hillier and Hanson, 1984). In school buildings, the arrangement of classrooms and corridors directly affects movement patterns and interaction frequency among students and teachers. Different spatial boundaries, whether open or closed, impose varying constraints on behavior and social interactions.

From a Space Syntax perspective, schools are less studied than other building types like museums or offices (Sailer, 2015). Consequently, our understanding of how school spatial morphology relates to social processes such as teaching, learning, and interaction is limited and largely based on scattered research.

This paper examines Sino-British school buildings to explore the relationship between spatial and social organisation through comparative analysis. By studying Shanxi Yuci No.2 Middle School and UCL Academy, it highlights significant differences in spatial morphology between Eastern and Western schools, providing an in-depth interpretation from a Space Syntax perspective.

2. Space Syntax

Space Syntax is a theory that analyzes the relationship between space and society by examining the structure and interconnections of physical components. It suggests that planning concepts constrain the relationship between space and its use, leading to two distinct architectural types: strong and weak programme (Hillier, 1996).

Hillier and Hanson (1984) observed that social structures position individuals in spaces that vary in proximity and separation, influencing movement and interaction patterns within and between groups. Thus, the organisation of space and how people navigate it are crucial for social behaviour and societal structure, with the characteristics of these layouts playing a significant role (Sailer, 2018).

Effective teachers adapt their styles to foster student autonomy (Jones, 2005). Classroom layout is key; Kishimoto and Taguchi (2014) highlighted that overly integrated designs can limit flexibility. Therefore, school designs should be evaluated for their adaptability to various teaching styles, allowing teachers to transition seamlessly between roles.

Based on Space Syntax theory, Sailer (2015) developed a framework to analyse school spatial and social structures. This framework combines teaching theories with Space Syntax concepts, focusing on how school buildings support activities. This framework helps explore how spatial layouts enhance connections, particularly between teachers and students.

3. Case study

This study compares Shanxi Yuci No.2 Middle School in China and UCL Academy in London to explore spatial layout and culture differences between Sino-British school buildings.

Shanxi Yuci No.2 Middle School is a mixed model high school in the city center, accommodating over 6,000 students in junior and senior high divisions. It boasts advanced facilities, including teaching buildings, an arts hall, a cafeteria, dormitories, and a sports field. Enclosed by a wall with small gates, students enter through the main gate, passing through a plaza and lobby before reaching their classrooms via the corridors.

UCL Academy, located in northern London, is a six-storey comprehensive school. The U-shaped building surrounds outdoor facilities, with no internal corridors; vertical movement occurs via stairs, while external platforms facilitate horizontal circulation and provide shade. Students learn in open spaces, and a rooftop terrace offers views of London, promoting learning and social interaction.

This study focuses on the two schools for their shared characteristics as mixed institutions with advanced infrastructure and attractive environments. Both promote students' overall development as public buildings, yet they exhibit similarities and distinct differences in spatial layout and culture.

Yuci No.2 Middle School exemplifies a typical senior high school in China with a "strong boundary" layout emphasizing order and discipline, leading to a closed design with clearly defined functional areas connected by strict corridors. In contrast, UCL Academy features a modern "weak boundary" layout, promoting openness with diverse learning spaces and flexible use. Its central and external corridors create an intersecting layout that encourages freedom and variability.

Yuci No.2 Middle School and UCL Academy represent typical school architecture in China and the UK, especially in outdoor spaces, learning areas, and circulation. These buildings showcase cultural influences from their educational systems and highlight differences in campus design, making them ideal cases for studying spatial layouts and their effects on teacher-student social behavior.

4. Spatial Analyse

4.1 Learning space

At Yuci No.2 Middle School, students adhere to a strict schedule and classroom discipline, with communication between classes prohibited and designated seating for quiet focus. Classrooms feature independent learning spaces, with desks arranged to face the podium, reflecting the school's emphasis on order and discipline.

UCL Academy prioritizes student autonomy and communication in its campus design. The "weak boundary" layout encourages exploration and interaction, while areas like laboratories adopt a "strong boundary" for safety and focus. This approach balances "strong programme" and "weak programme" across various learning environments to optimize teaching outcomes.

4.2 Circulation space

At Yuci No.2 Middle School, the layout (Figure 1) connects functional areas via corridors, with the main teaching building divided into northern, central, and southern sections. Classrooms are oriented north-south around a central corridor, creating a symmetrical layout that promotes efficient movement for teachers and students, supporting structured learning activities.

UCL Academy's layout (Figure 2) features central and external corridors that connect classrooms and offices, forming an organized circulation network. Internal corridors link classrooms, offices, and stairs, passing through the open "super studio," which fosters learning and creativity. The open central corridor integrates teaching with sports, enhancing interaction and creating a flexible, focused spatial environment.

Both schools expanded their ground-level entrances to create atrium spaces, enhancing circulation. By combining corridors, enlarged stair platforms, and the atrium, they transformed enclosed circulation areas into open spaces, fostering spontaneous student interactions and social activities.

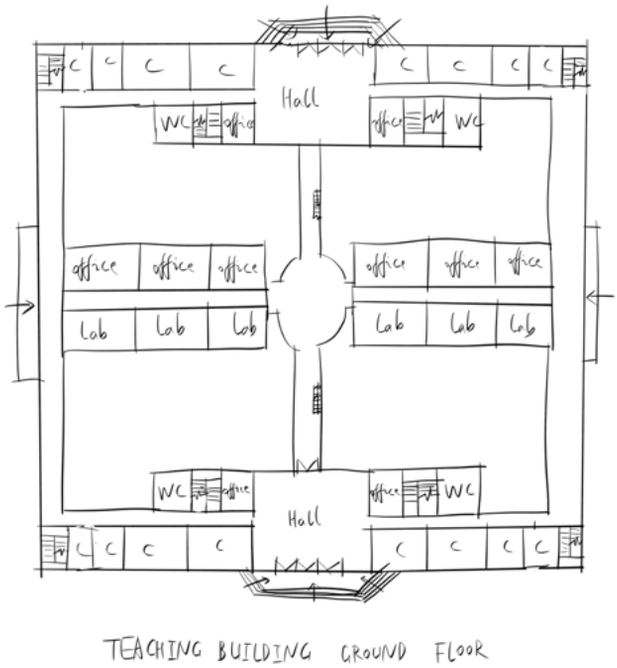

Figure 1. Yuci Second High School ground floor plan

Figure 2. UCL Academy ground floor plan

4.3 Outdoor space

Yuci No.2 Middle School emphasizes order and teacher authority with clear spatial boundaries. While activities are regulated, areas like gardens and pavilions offer relaxation, allowing students to enjoy nature and interact. The artificial lake provides a serene escape from classroom noise, enhancing campus life with flexibility and a human touch.

At UCL Academy, the south-side courtyard and playground offer spaces for relaxation and activities, facilitating student gatherings during breaks. A unique rooftop terrace on the fourth to sixth floors provides informal learning and fresh air, overlooking the courtyard. In contrast, Yuci No.2 Middle School's rooftop platform is closed for safety reasons.

5. Spatial Culture

5.1 Closed vs. Open

Chinese school buildings, like Yuci No.2 Middle School, often have clear boundaries, with teaching, accommodation, and sports confined within these limits to reduce distractions and promote focus. However, this enclosed design may restrict

students' interactions with the outside world, limiting their opportunities for broader experiences and affecting social adaptability.

UK school architecture, exemplified by UCL Academy, prioritises individualism and freedom. Its flexible classroom and lab layouts have blurred boundaries, allowing students to move freely and fostering interaction, socialisation, and interdisciplinary collaboration.

5.2 Fixed vs. Flexible

In China, school buildings, such as at Yuci No.2 Middle School, reinforces school control for effective education. The teaching building features clear administrative zones with different grades on separate floors, facilitating management. Strict regulations govern classroom use, and staff areas provide a quiet work environment. Teacher and student movement streams are separated to reduce congestion, while some areas are accessible only to teachers, enhancing management.

UK campus, exemplified by UCL Academy, features open layouts that encourage interaction and academic freedom. Classrooms and corridors have blurred boundaries, enhancing collaboration and allowing for engaging teacher-student interactions. This flexible environment supports diverse learning modes improving space utilisation and giving students greater autonomy in choosing their learning environments based on their needs and interests.

5.3 Centralised vs. Decentralised

In China, teaching buildings are centrally located to emphasise order and reflect cultural values. Yuci No.2 Middle School showcases a symmetrical design aligned with traditional Chinese regulation. The campus maintains distance from walls for safety and privacy, with teaching, dormitory, and administrative spaces concentrated efficiently.

At UCL Academy, traditional walls are replaced by buildings flanking the entrance, creating a seamless connection with the surroundings. Administrative spaces are strategically placed and easily identifiable through signage, resulting in a rational layout. The integration of teaching buildings with recreational areas fosters a diverse environment that encourages interaction.

6. Conclusion

Overall, Shanxi Yuci No.2 Middle School prioritizes logic and order with strong boundaries in classrooms, while including weak boundary areas for relaxation. In contrast, UCL Academy offers a flexible design that promotes a vibrant learning environment, encouraging student interaction during breaks and fostering social engagement. While most spaces have weak boundaries, laboratories maintain strong boundaries for safety, balancing flexibility and security.

Yuci No.2 Middle School embodies a spatial culture of closure, fixity, and centralization, reducing distractions and enhancing focus. Fixed arrangements promote familiarity and belonging, while a centralized layout boosts resource efficiency and supports traditional teacher-student relationships in a respectful learning atmosphere. In contrast, UCL Academy emphasizes openness, flexibility, and decentralization, facilitating knowledge exchange and quick adjustments for diverse needs, fostering student autonomy and responsibility.

In summary, campus design should align with diverse learning methods, moving beyond traditional layouts (Fouad and Sailer, 2017). Schools are complex systems, and no single spatial configuration can meet all educational needs. The differences between strong and weak boundaries indicate the evolution of closed and open systems. Thus, campus design must be flexible and adaptable to support various teaching activities and foster holistic student development.

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