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Design for Chinese University Campus  
Master Thesis explanatory document  
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1. INTRODUCTION

1.1 RESEARCH QUESTION

In China, universities are designed as “forbidden cities” or a “castles”. It is surrounded with walls. No one can easily walk or drive into it and its independent transport system is not normally accessible by the general public. All the students have to live on the campus. All the facilities of life, for example, accommodation, business, academic, sports, leisure, hospital, garden, etc., are included in the campus, but not allowed to be used by the public.

However, since the rapid development of Chinese higher education, many large-scale new universities have been built. Because of the limited availability of land of city centres, many of them have chosen to establish a new campus in an undeveloped rural area. These new campuses are still designed in a “forbidden” way, which are not related to the city. Then, problems arise from the large scale, and, especially, in the future, when the rapidly developing city expands to engulf this area, the relationship between the city and the campus becomes complicated.

Therefore, my research question is:”How can we design a university campus in China to meet current and future need?”

1.2 OBJECTIVE

- To find an architecturally sound way to develop a university campus in China;
- To develop a masterplan for a campus that will suit both current and projected city needs
- To carry the overall concept on into the architectural stage of individual building design
- To provide a learning-oriented student environment that provides also for their quality of life; and
- To achieve a good balance between public and private spaces of a campus, for both the current situation and for future changes.
2. METHODOLOGY

Research for design and research by design are both important for this project. The main target of this project is to find an improved way of designing a Chinese university. Hence, to study how the existing universities were designed, what the shortcomings are of current designs, and what is needed to overcome these shortcomings. Also, as a comparison, it is useful to investigate university designs in different countries to understand how they deal with such problems, the reasons for their solutions, and how they succeed (or not).

Then, in the project design, to develop a suitable architectural concept, to complete a master plan of a campus, and to design one or two buildings in the campus to show the continuation of the concept into the architectural method of investigating whether the improved method of campus design is appropriate for Chinese circumstances and how or to what degree the method can be used in China.

Study of design codes in China should be completed since the project needs to be built now. Meanwhile, study of the environment and of the development strategy of the site is also required since the design is for the future. Data collection for the site, city and the country can be done by visiting the website of the State Statistical Bureau, the local statistical office and the planning bureau of the district. Then, depending on the data and the design code, data calculation is necessary.
3. REVIEW OF CURRENT STATE OF KNOWLEDGE

“Among the several thousand accredited colleges and universities, only a few have not in recent years made notable changes to their campus facilities. Some merely added to or modernised a handful of buildings. More typically they acquired additional land to create new campuses or subdivided scarce existing campus space into smaller segments to accommodate new demands for building.”

– Stephen A. Kliment

Not only in recent years, since the first university was established in the Middle Age in Europe till now, universities around the world have made dramatic changes to adapt to differing conditions and requirements. To study these changes, the whys and wherefores, and how the designers approached the issues involved, can help us to determine the possible direction of development of universities in China.

3.1 CONDITIONS OF UNIVERSITY DEVELOPMENT

3.1.1 UK

The origins of British university system are quite ancient. The early universities were merely gathering places for students to learn from renowned scholars. Also, because the early human knowledge was centred around religion, the scholars were those who brought messages from God to the populace to solve their problems – they were preachers. Hence, the intellectuals and the scholars were actually religious leaders. Therefore, the forerunners of modern universities were actually schools of theology.

The development of universities was quite slow before 19th century. Until the nineteenth century, there were only a few universities in Britain. The world famous Oxford and Cambridge were in England. Scotland had five. However, Ireland and Wales did not have any.

The great change started from Industrial Revolution. The industrialisation of society created a demand for more well educated skilled people, scientists, superintendents, teachers, and so on. Starting in London, a large number of universities and colleges were established at that time. Also, as industries developed, many civic universities were founded in industrial

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cities, such as Manchester, Liverpool, Birmingham, etc. Because of the need of engineering and scientific development, rather than focus on the religious and classical studies, the universities which were established during this period concentrated on technical skills. This tendency continued after the First World War.

Another large expansion of British university development took place in the 1960s after Second World War. During this period, the number of universities more than doubled and the existing universities were growing rapidly. The great need caused by population growth and technology development after war was the main reason. The “Science and Technology” universities and “greenfield” universities were all established at that time. The “Science and Technology” universities grew out of technical institutes. The universities which had new campuses in the fields out of the cities were called “greenfield” universities. Their brand-new campuses, attractive environments, beautiful buildings and good equipments became a model of universities in Britain.

Having a stable society and good economic environment, the British government started to focus on the education of entire people of the country. In order to improve the spread of education, in 1992, the government passed the Further and Higher Education Act policy to allow 38 Polytechnics to become modern universities. Also, the advance of technology and science leads to the development of universities and colleges. In the new century, a number of polytechnics and colleges were authorised to become universities. Most of these universities have more than two campuses. One is the original campus, the others are new campuses. In this way, these universities can retain both traditional and modern characteristics of their campuses.²

3.1.2 USA

America has a different situation from UK. The first nation’s institution of higher learning was Harvard College – the predecessor of Harvard University – which opened in 1638. During the colonial period, all the universities were compelled to follow the British education system. The universities or colleges were all private and been controlled by churches and provided parochial education. Until 1776, the year of victory in the American Revolution, America only had ten universities.

² http://www.opsi.gov.uk/acts/acts1992/ukpga_19920013_en_1
The success of the Revolutionary War was a milestone in the development of American universities’. America's literacy rate was one of the highest in the world at that time. Also, after independence from colonial control, the American government put a great emphasis on education. They realised that, only to have private universities would not be enough for the higher educational needs of the entire populace. Hence, a large number of state universities were established rapidly by the government. The first state university was established in North Carolina in 1795.3

Another stage in the development of American universities occurred after the Civil War. A unified republican government brought a stable environment for industrial and economic development. Many wealthy capitalists contributed large sums of money to establish universities to train men for their or society’s needs. Also, the government adopted tax-reduction policies to encourage people to contribute money for running universities. For example, the John Hopkins University, Stanford University, Vanderbilt University, Duke University and University of Chicago were all established during that time. Moreover, President Lincoln signed the famous “Morrill Land-Grant Colleges Acts of 1862”4 in 1862 to demand that, each of the states should to have its own government-funded state university. These universities were called “Land Grant Universities”. They are specialised in engineering and agriculture education. More than sixty universities were opened at that time and they could admit low income people. Also, these universities improved the development of rural areas in each state.

The development of universities is always related to population growth. In the middle of the 20th Century, the great number of young people, who were born after the Second World War, needed to go to universities. The number of students has grown from 1,400,000 in 1940 to 7,600,000 in 1970. Also, the rapid development of technology, especially space technology, contributed greatly to the growth in both size and number of American universities.

3.1.3 Japan

Asian countries’ education development methods are different from those in western

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3 http://www.360doc.com/content/09/1216/22/508875_11300556.shtml
4 President Lincoln signed the act of 1862, and then it was amended in 1890 to become the “Acts of 1862 and 1890”.
countries. In most cases, the development can be separated into different stages. A well-developed country – Japan, which has a long history and classical culture, can be a good example to study.

The earliest Japanese “university system” was established in 670 A.D. It is even earlier than any European university. The whole system imitated the Chinese education system, in that the highest school was run by the central government and local schools by local governments. Japanese education was influenced by the Chinese Confucian academic system for nearly a century, until the 16th Century, when Japan was reformed by a new regime – the Tokugawa regime. The ruling class still followed the Chinese Confucian Academic System. To achieve a higher literacy rate, more schools were established during that time.\(^5\)

The famous Meiji Restoration in 1868 was a milestone in Japanese history. It modernised the whole society, including the political, social, economic and even the cultural structure. This can be regarded as the official start of the history of modern universities in Japan. The people who studies aboard brought back western academic system and used those experiences to establish the first batch of full-universities. These universities included some ancient schools from earlier centuries, some new universities established by the government to teach liberal arts, science, medicine, agriculture, etc., and some private universities which were founded by wealthy and well-educated people. The universities were highly influenced by American models. Since the American Black Ships entered Tokyo water at that time, the leading educators of the revaluation were able to be educated by the American system.\(^6\) The mind opening of the educators and government also led to a reduction in sexual discrimination. The model, size and plan of Japanese universities have been different since then.\(^7\)

The expansion of the number and scale of Japanese universities was obvious during Japan’s occupation period. In order to expand the country's land and the people’s education level, many technical institutes were established in that time.

From the 1960s to 1980s, Japanese experienced an economic recovery after the war. This demanded a growth in higher education.

\(^6\) Ibid., P.61-65.
\(^7\) Ibid., P.91.
In 1985, the Prime Minister Yasuhiro Nakasone set up the “National Council on Educational Reform” to be the new direction of education. From then, Japanese universities started to open to the West and be international and flexible.

### 3.1.4 Findings

By looking at the timing of the development and changes in universities in the UK and USA, it is not difficult to notice that wars and revolutions can be catalysts for changes in universities. The reason is these conditions could stimulate the development of economy and growth of population. Therefore, the universities would respond to the development by increasing in number or/and in scale. The development of Japanese universities experienced two stages. The main reasons for change were still the development of the social environment – economy and population. Also, the function of universities changed during the development.

### 3.2 HOW TO CHANGE

“Deliberate campus plans range from those that work with a clean slate to those which must integrate new and old. The plans can be grouped as follows: new campuses, sector plans, insert and add-on plans, and plans for regeneration. In the first two instances, designers should have no difficulty in integrating placemaking and placemarking… In the second two instances, designers typically have to modify, manipulate, and/or mutate an existing environment.”

— Richard P. Dober

Dober grouped the campus planning jobs into new site (new campuses and sector plans) and original site (insert and add-on plans, and plans for regeneration) designs. All of these types of design job can occur during the expansion of a university campus. In investigating the cases below, it will be helpful to find out the development results of different situations of universities and the various methods of design.

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3.2.1 University of Manchester

The University of Manchester was the result of a merger in 2004 of together by Victoria University of Manchester (established in 1851) and University of Manchester Institute of Science and Technology (established in 1824). Both of the universities were established during the Industrial Revolution to meet the requirement for technically trained personnel in the world’s first industrial city – Manchester. They both had only one building in the city when they were opened. Over the centuries, Manchester City has expanded from a township to the second-largest city in the United Kingdom by 2002. Together with the city, the university’s campuses are spreading.
The University of Manchester is a good example of how a university develops with a city. This type of campus did not normally have a master plan when it was built, but the whole campus would follow the grids of the city. The city’s transport system is not separated from the campus. Therefore, it is easy to access any part of the university. The buildings of the university may not be grouped by function, but according to the city’s planning. The facilities of city and the campus can be shared by each other, for example, the library, museum, shopping mall, hospital, etc.

The examples like Manchester University which started from one or several buildings, then, developed together with the city are many. Examples include the University of Liverpool, University of Auckland, University of Durham, etc. Most of these universities’ facilities, transport systems and education space were all or partly integrated with the city in which they are located, during their development.

3.2.2 Stanford University

Architect Mike Evans, of the firm Hanbury Evans Wright Vlattas in Norfolk, Va., which has worked on campuses worldwide, says “For larger universities, a ‘clear diagram of organization’ and ‘a continuity of materiality’ are key to safeguarding their beauty. Schools like Stanford University have painstakingly managed to maintain their distinct aesthetic and true sense of place, despite extensive growth.”

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As a campus set apart from the city in 1888, Stanford University’s original master plan was more ambitious and monumental than any previous campus design.\textsuperscript{10} Since it was a “lonely” site, the planning focused on two main axes – north to south, Palm Drive and west to east, which was a leading factor for the campus spread (the red mark). Indeed, the subsequent development of additional sectors still followed the original planning, although new axes were put into to complete the campus grids (the green and blue mark). Moreover, the Second Century Planning of the whole campus restored the historic and environmental features from the last century and developed the grids of the original plan. The campus is praised as “the best example in America of a powerful master plan that was largely executed, has been conscientiously preserved, and serves as the continuing inspiration for future development”.\textsuperscript{11}

After the Second World War, the campus designer started to design a transport system in the campus, since motor vehicles were largely used in the campus. A ring road with a green

\textsuperscript{11} Ibid., p.7.
belt was the beginning. Then, following the grids and the ring road, the whole campus transport system was established to connect well with the urban transport system. Also, the ring road and green belt can act as a buffer zone between public traffic and campus traffic.\textsuperscript{12}

The building style of Stanford campus includes red-tile roofs, arcades and buff-coloured walls to flat roofs, blank and reinforced concrete walls, to now sustainable designs. From classical to modernist, the process reflected the technological and cultural developments of the USA. Especially in the new century, the principles of sustainable design are used widely on the campus to reduce energy cost and protect the environment, such as, on-site management of storm water, protection of heritage trees, and the development of additional bicycle and pedestrian facilities.\textsuperscript{13}

Also, Stanford University is a good example of campus planning which included the relationship with the public in the early 20th Century. Even though the campus did not border on the city when it was built, the master plan still took into account the relationship with the surrounding area. Also, it reflected the Beaux City principles of the emerging City Beautiful movement in America, with its visions of great boulevards, plazas, and inspiring public buildings.\textsuperscript{14} After more than two hundreds years’ development, now the campus is not “lonely” anymore. The city is fully surrounding the campus. After the built of Stanford Stadium, Stanford Shopping Centre and other small local facilities, it is difficult to find a clear boundary of the campus. Also, since a big percentage of the campus environment is residential buildings, many facilities which are owned by university are opened to local residents, such as, library, hospital, gym, swimming pools, and tennis court. At the same time, it was useful to put the sports facilities between the academic area and the city to mitigate the disturbance from the city and for local resident’s easier access. In the planning of the new century, the university apartments are built along the road for convenient transport.

There are many universities like Stanford University. They were well planned as a small campus apart from city. Then, after the city expanded over a period, they have merged together. The campus’ boundary is disappeared or partly disappeared in the city.

\textsuperscript{13} Ibid., P.163.  
\textsuperscript{14} Ibid., P.4.
3.2.3 Keio University

The history of Keio University parallels the history of Japan's modern era. The university was founded by Yukichi Fukuzawa in 1858. The first campus of Keio University – Mita Campus – was established in 1871. With its western-style buildings, Mita Campus represents the beginnings of Japanese modernisation. One after another, since then, Keio University set up six campuses in Tokyo City. Because of the land limit, each of the campuses is not big. They are well connected with the city’s public transport system – railway. Also, each campus occupies only one city block. So, it will not add to the pressure on the local transport system OR will not be a burden on the local transport system.

The planning for each campus is varied, because of the differences of site situation and time of establishment. However, the basic service facilities are well provided in each campus, such as: accommodation, café, library, meeting room, lecture rooms, gym, etc. Also, since each campus is only a city’s block, it is difficult to maintain privacy on the campuses. Landscape is typically used to separate the educational space from the public environment and to provide a green belt for local residents. Meanwhile, green roofs are used in some campuses for sustainability, higher land utilisation and to provide more private green space to students.  

This is another type of university development, other examples of which are the University of Hong Kong, the University of Tokyo, the National University of Singapore, etc.

15 http://www.keio.ac.jp/english/about_keio/history/index.html
They are typically located in crowded or land-limited cities or countries. These cities also have booming period which can cause quick lose of land. Hence, in a special way, the university campuses develop with the city and are integrated into the city.

3.2.4 Findings

By analysing different types of university campus development, it is not difficult to find that the campuses may be established in distinct situations with diverse planning requirements. However, during the expansion of the city and the university, the tendency of the development is that the campus will integrated into the city in different ways and to different extents as a part of the city.

3.3 CHINESE UNIVERSITY DEVELOPMENT AND THE CURRENT SITUATION

3.3.1 Chinese University Development

Chinese universities also experienced two stages just as Japan’s did. The origin of education in China started thousands of years ago. The very first school was set up for nobles to teach their children in the Shang Dynasty (1600-1046 BCE). Then, during the Zhou Dynasty (1045-256 BCE), the government founded five national schools. Confucianism, well-known in the world, began at that time. Also, Confucius started to advocate the unity of society and established the first private school to open to the public, and thus the first Chinese education system began. In 605, the Emperor Han Wu set Confucianism as the national educational doctrine and started the Imperial examination as the educational system. This system was used by the Chinese Empire seeking out useful administrators until 1905 and Confucianism has influenced Chinese culture for thousands years.

From the middle of the 19th Century, when the opium wars were fought, western culture has infiltrated into China. Missionaries started to build mission schools to bring the western university system into China. Then, university was established at the end of 19th Century by Chinese who had had good western educations and teaching experiences. The aim was to train Chinese people with useful skills and enlightened ways of thinking, then, to modernise China. But the complicated social environment was not a fertile ground for the development of the Chinese universities. Many universities shifted their locations during that swinging period. Until the establishment of People's Republic of China, there were only 205
universities and institutes in China. A careful development of China and Chinese universities was instituted for a short time. Then, the Great Proletarian Cultural Revolution stopped everything, until 1977.

The Chinese economic reforms in 1980s established a background for a massive development of Chinese universities, in both size and number in size and scale. Especially in the 1990s, the Chinese government changed the university education strategy from elite education to populace education. From 598 to more than one thousand, the number of universities doubled from 1978 to 2009. As shown as the diagram, the number of university students rose rapidly.\(^\text{16}\)

![Graph: University Student Number From 1977-2009 in China](http://www.edu.cn/gdjy_9344/)

### 3.3.2 The Current Situation and the Reasons for It

In the situation above, nearly every university is spreading in China at the moment. Since many of them do not have enough space for additional buildings in the original campus, they have started to focus on land in rural areas near of the city. One reason is the low price of land. Also, since rural land is sparsely occupied, it is relatively easy to obtain in order to provide for the design of an entire campus.

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\(^{16}\) [http://www.edu.cn/gdjy_9344/](http://www.edu.cn/gdjy_9344/)
However, the planning of new university campuses in China has not been developed with the economy and society in mind. The earliest campus planning in China was adopted from western countries. A few of them followed the American style but more of them were based on Soviet Russian ideas, due to the political background. This type of planning stressed the symbols of power. The campus normally has a main entrance with a big square and an important building toward the entrance. The other functions are located around, and oriented to the central area. The functions are normally grouping located. Also, since people started to build buildings in China, every unit was enclosed within a wall – country, cities, family compounds, and, of course, schools. Now, campus planning has inherited the Chinese culture of enclosing walls. Moreover, in China, students are compelled to live in the university. So, the university campus is like a “forbidden city” currently.

Unfortunately, all of these features were carried on in the new campus planning without careful thought. Differing from the old, step by step developed campus, the new one-step planned campus has more problems.

Examples ONE:
Sichuan University, 2002, Sichuan Province, China
The new campus of Sichuan University was located far away from the city centre. The city’s rapid development caused it to expand. Now the campus is on the boundary of the fourth ring-road of Chengdu City, Sichuan Province. The campus is mainly surrounded by a residential district, and commercial buildings. High traffic volume has started to be a problem now. In particular, the traffic pressure from the university itself has become a major issue, since not enough thought went into the entrance design or into the relationship between the campus traffic system and public traffic system.

The traffic system in this campus is neither designed nor fully successful. The motor vehicle road does not provide access to every building and there is not enough space can be used in the future. It may not be a problem at the moment, but in the future, when the traffic volume becomes higher, transport problem will manifest.
Example TWO:

Shandong Architecture University, 2001, Jinan, Shandong, China
As another rural campus, the Shandong Architecture University’s new campus was established on a sloping field around a hill with no surrounding buildings in 2001. Now, the city’s spread has already overtaken this site. The campus is surrounded by residential buildings, industrial factories, and city’s highway and main roads.

With a better transport system design, the function design of this new campus still follows the old zoning idea. The whole campus is divided into a residential area for students, educational area, sport area, support area (including canteen and shops), etc. However, the large distance between these zones is a big problem. For example, to walk from the student
hall to library can take 15-20 minutes. If a student needs to go further, such as to the engineering school building in the far south end, it will take nearly half an hour. Also, students are not allowed to drive in the campus. Bicycles are allowable, but to ride a bicycle in 35°C sunny summer and -10°C windy winter on sloping roads is a daunting prospect, and many students do not attempt it. Furthermore, nearly all the support facilities are in the residential area. Therefore, students have to walk to their classroom every morning, walk back to the living area for lunch, walk to the classroom again then walk back for dinner. As I have mentioned before, all the students have to live in the campus. Hence, if they want to study after dinner, another round of walking back forth between the library or classroom and the student hall will be required. If it is rainy, windy, snowy or foggy weather, so much the worse for them.

The educational buildings are mainly large scale U-shape buildings with a courtyard in the middle. It is a good idea to form a communication and social space for students, as they tend to lack communication and understanding in the internet-prevalent society. However, the poor orientation and design of the entrance location results in cold and “deserted” courtyards.

### 3.3.3 Findings

These examples show that the problems of Chinese modern university still following the old campus design strategies are obvious to see.

Firstly, the campus is located in a site some distance away from the city. Students’ lives are isolated and boring. So, many students start to rent a dwelling in town, even though they have to pay for the student dorm. According to a survey, the number of students who are not living on campus has risen to 10% and the number is still growing.\(^{17}\) So, it may be reasonable to assume that, in the future, the university will no longer compel students to live in campus.

Secondly, to use the zoning method for large scale campus planning can be a critical issue. From my personal experience, the long walks can be a very important factor in the reduction of students' motivation to learn.

To design a campus only for the present is also a problem. The traffic system designed only with current needs in mind will not be enough for the near future. Also, a lack of space allowing for future parking buildings is a defect for many campuses. The data below can

explain why this issue is necessary to take into consideration. “The rough number of private cars in China was 6,253,300 in 2000. In 2005, the number had increased to 18,480,700. By the end of 2009, the number reached 43,332,800.”\(^{18}\)

As I have already mentioned, universities tend to merge with the adjacent city. Hence, when the universities open the campuses to the public without surrounding walls, there can be problems:

Since the campus is treated as a single isolated village, the traffic system is designed independently. Once the city starts to surround the campus, the campus traffic system will not be able to connect with public traffic system. Serious pressure will be placed on the city transport system. To release this pressure, the campus roads should be integrated into the public transport system to a certain degree.

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\(^{18}\) http://www.stats.gov.cn/
4. PROJECT DEVELOPMENT

4.1 DESIGN PRIEND

The university which I have designed currently has about 16,000 students, ten schools, and more than 30 majors. The university leaders believe they will expand to 30,000 students in the future.

The Current Student Numbers:

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>STUDENT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>School of Architecture &amp; Urban Planning</td>
<td>1600</td>
</tr>
<tr>
<td>School of Art</td>
<td>1700</td>
</tr>
<tr>
<td>School of Civil Engineering</td>
<td>2900</td>
</tr>
<tr>
<td>School of Mechanical &amp; Electrical Engineering</td>
<td>2500</td>
</tr>
<tr>
<td>School of Municipal &amp; Environmental Engineering</td>
<td>1000</td>
</tr>
<tr>
<td>School of Computer Science &amp; Technology</td>
<td>1500</td>
</tr>
<tr>
<td>School of Information &amp; Electrical Engineering</td>
<td>1300</td>
</tr>
<tr>
<td>School of Heat Energy</td>
<td>1200</td>
</tr>
<tr>
<td>School of Materials Science and Engineering</td>
<td>1200</td>
</tr>
<tr>
<td>School of Engineering Management</td>
<td>2000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>16000</strong></td>
</tr>
</tbody>
</table>

The school should include: educational facilities, student accommodation, library, auditorium, sports facilities, catering, etc.

4.2 SITE ANALYSIS

The site is in Lvliang City (east longitude 110°22′-112°19′, north latitude 36°41′-38°43′), Shanxi Province, north China.

4.2.1 Lvliang City

Lvliang City, a second-tier Chinese city is located in the valleys between several hills which belong to Lvliang Mountain. Its main local economy is based on light industry and
food industry. Lvliang City has had annual population increases of 26,000 over the last ten years. Now its population is 3,640,800. As the city's population and economy developed, so too the city's size has expanded rapidly since 2000. Hence, the government formulated a plan for the city’s development from 2004 to 2020. As the picture showing, the old city will extend along the valleys to the north, south west and east. Also, in the west, a new CBD will be built. In the south, the industrial area will be developed. To the north, an educational district with related commercial functions will be built.

The weather of Lvliang has a semi-arid continental monsoon climate, with four clearly distinct seasons. It has a dry and windy spring, hot but rainy summer and a cold and dry winter. The average temperature in summer is 25°C, and in winter is -3°C). The amount of precipitation is small. The winter sun angle of Lvliang is about 30° at the winter solstice.

4.2.2 Site

The site is located in the new educational district, north of Lvliang. From the 2004-2020 city plan we can see that the main road, and a developing axis of the city, the Longfeng Road, goes along the west edge of the site. On the west side of Longfeng Road, the railway station is a major feature of the site. Fortunately, the green open space between the
station and the road reduces the effect. Other features of the site are the residential district and the commercial area. On the east side, the Beichuan River goes between the site and a large residential area. As an important landscape element, Beichuan River and the green belt on the side of the river will have a very good impact on the site, and a visual connection between the site and the city. On the north side, another campus is planned. On the south side, a city exhibition building with a large square will be built.

The site is about two kilometres in length (north – south) and five hundred meters in width (west-east). The whole area is 87.5 hectares in size. Aside from the roads, the useful area is about 80 hectares.

The ground of the site is quite flat. The north-west corner is 15 metres higher than the south-east corner. A branch canal goes through the middle part of the site. This can be a landscape node of the campus. The whole site is in a cultivated lands area at the moment. No hard-surface road or building currently exists on the site.
4.3 DESIGN CHALLENGE

According to the findings – it is a tendency for university campus to integrate into city – and to carry on the Chinese special situation, some of the issues of university will be changed because of the open planning (without enclosing walls) of campus.

It is a design challenge to treat different issues in different ways.

4.3.1 Issues of complete change: Space

Private – Public: Without walls, people can walk onto campus unhindered. Therefore, the spaces (for example, square, boundary green belt, space between buildings and walls, etc.) which are only used by students will not be “private” any more. Instead, these will be opened up to the public.

Backyard – Frontyard: when the campus has walls, space between buildings and the wall are never designed carefully. However, once walls are removed, this space will be open to the public road, and will be seen by people. So, to design it with careful thought into the nature of welcomes, barriers, decorations and the meanings of symbols is necessary.

4.3.2 Issues of Partial Change: Occupants of Buildings

Accommodation: Accommodation is designed for all the full time students at the moment in Chinese universities. The quality of the living environment is restricted by the site limitations. According to the data, last year, more than 70% universities in China have students who choose to live off campus. Even though they have to pay double rents, the number of such students is still increasing. The main reasons may be a desire for better quality of living arrangement, greater freedom, civic life, or more independence. Therefore, the reasonable anticipation is, in the near future, living on campus will no longer be compulsory in Chinese Universities. At that time, the on-campus accommodation will be over-supplied for students. Then, it will need to allow for public occupants again. Moreover, it will be possible to change some of the residences buildings into higher quality residents.

Library: In recent years opening the libraries to the public has been advocated in China, since western countries’ universities have already set good examples of knowledge and information sharing.

Support: Supports facilities can include café, canteen, shops, gyms, sports ground, etc. Once the campus is open up, these functions will be accessed by members of the public.
people. Also, to let these commercial functions of university join in the social commercial environment can be helpful for them to keep quality and gains.

Traffic system: To open the campus does not mean that the public traffic can go through the campus without any controls. However, a campus traffic system should be considered as part of city’s traffic system.

4.3.3 Unchanging issues: Function

Education: Of course, the function of the university will not be changed. Hence, the educational buildings will not be changed either. To build up an orientated and comfortable learning environment is still the goal of campus design.

Private space: One thing needing to be emphasised is that, to open the campus up and to integrate it with the city does not mean that private space are not necessary for the learning environment. To provide a less disturbed study and communication space is one part of creating a comfortable learning environment.

4.4 DESIGN CONCEPT

4.4.1 Shanxi Traditional Courtyard – Dayuan

Dayuan means family compound or courtyard in Shanxi.

The form of the courtyard comes from the long term evolvement of local culture and environment. However, the specific Dayuan started to appear three hundred years ago, during Qing Dynasty, in the homes of wealthy businessmen. At that time, many local people went out for business because this province was on the boundary of the country. Then, the successful business people came back to their home town to build houses for their family. So, many family compounds were built during that period. There are five of them have been maintained by the government after wars. 19

19 http://www.sxqjdy.com/dayuangk.htm
Qiao’s Family Compound

This family compound was built in 1765. The whole compound is about 8700 m<sup>2</sup>. From the pictures we can see that a west-east way corridor goes through the middle of the whole site and separates the compound into south and north parts. Each part has three small courtyards. In each main courtyard, the buildings are built around the courtyard to form a “口” shape. The footprint of buildings covers 70% area of the courtyard. The courtyards are all long and narrow in shape.

Apart from the garden in the north-west corner, all the buildings in other five courtyards follow north-higher, south-lower rules. The reason of this rule is to show the important location of the north building in Fengshui, since the rooms in north buildings are occupied by the owner of the courtyard – the parents. Following on from this, children, then grandchildren live in the west, then the east rooms. So, sometimes, in other family compounds, we can see the west buildings are higher or bigger than the east buildings. Also, the benefit of this arrangement is to get good sunlight access for each building and good view control for the important buildings.

All the roofs of the buildings surrounding the courtyard slope down to the courtyard. The special function of the roof is to collect rain water, because water stands for wealth in Chinese Fengshui. Also, the slope in roofs can form the external high walls which surround the whole compound. The external walls are normally heavy and do not have big windows. This form can provide a private, safe and comfortable internal environment for the family.
Roofs in Qiao’s family compound are all at the same angle – 30 degrees. This is also the winter solstice sun angle – the lowest sun angle of the year – of most part of Shanxi Province. Therefore, this roof angle can provide for natural light reached rooms for occupants.

Another architectural design issue of this family compound is the parapet wall and observation deck on the top of buildings. The function of the decks is for security people to protect the compound over night. The parapet is for people to check the situation outside of the compound.

Wang’s Family Compound

This is an example of a large-scale family compound.

In this compound, the building form still follows the rules of north-higher, south-lower, 30 degree roof angle, slope towards the courtyard, tall external walls, long and narrow courtyard shape, etc.

Meanwhile, the observation deck is changed to a round paved corridor which surrounds the whole “castle”. The Wang’s family compound has more city features in the planning. The transport system is designed in the most common way used in Chinese city planning –
following the directions of longitude and latitude. Straight long axis road go through the middle of the site, in north-south lines. Then, three short west-east roads divide the whole site equally. The latitude roads are always wider than longitude roads because of the sun orientation. One thing that should be mentioned is the reason that the longitudinal road does not touch the north end is that, according to Chinese Fengshui, two doors cannot face each other without a separating barrier between them.

There are 27 courtyards in Wang’s family compound. Each courtyard comprises two yards connected together. Also, in each courtyard, the north building is the tallest one, the south building is the shortest one. The tall north building, instead of having a single block form, has on the second floor three small rooms surrounding a balcony, which starts to create a space for relaxing and cooling off.

4.4.2 Why use this concept and How

As a famous and tangible part of Shanxi Province's cultural heritage, the Dayuan (type of courtyard) holds a special significance for Shanxi people. To use it as a central concept in this campus design provides an integral cultural link with the city.

Also, to have local architectural language in the campus design can form a city landscape for urban environment and a special symbol for this university. Even though the university will expand in the future, maybe outside of this campus, to still keep this style in future planned buildings will make it easy for people to identify the campus or buildings as belonging to this university.

Furthermore, to carry on the idea of the courtyard in campus design can create private open space for students. Also, in this age of widespread internet and computer use, face-to-face communication is becoming less and less normal on campus. To use courtyards or courtyard-form open space to provide more chances for communication will be necessary.

However, to use the Dayuan as a central feature of my design concept does not mean I will copy all the features and form of Shanxi family compound. Reasons are:

- As residential buildings, many architectural issues of Dayuan are not suitable for educational functions. For example, the enclosed external walls of a Dayuan can provide private space for people, but collide with the idea of open campus design.
- Dayuan is a classical architectural form. What I am going to design is a modern
functions campus with modern function, technology, materials, scale, etc. Features which I am going to use also need to be “modernised”. For example, I will use the sloped roof of the Dayuan. However, since the modern buildings are bigger in scale and have more levels, the roof will cover more than just one level. So, the roof becomes a wall instead. The design strategy will be different.

4.5 DESIGN PROCESS

4.5.1 Context, Entrance, and Transportation Analysis

The main idea of setting up the entrance is to reduce the pressure and influence or disturbance of the public traffic system. As I have mentioned, the road on the west side of the campus, Long Feng Road, is a main road of Lviang city. On the east side of the site, there is a riverside road, Bin He Road, which has a lower traffic volume. Therefore, to let the entrances be a part of public road intersections would provide for easier management by the urban transportation system. According to this, two main west-east roads can be located in the campus. Also, other two entrances on the east side can be a view connection or traffic continuation from the west side.

Also, the axis can be both a view control axis and a main transport element of the campus from north to south. On the north end, the entrance will meet or to be close to the entrance of the neighbour university. On the south end of the campus, the site boundary road, Lian Qiao Road, goes across the river. So there is a bridge at this point, which means that an entrance cannot be put here. Meanwhile, following the trend of the urban roads, it would be reasonable to build another bridge on the river to connect with the campus. Also, on the west side, a small pass way can be set on the site of the exhibition hall. The small triangle shape can be used as an urban landscape before a big civic building. Therefore, two other entrances are provided. Following the concept – Dayuan’s transportation style — the main campus transportation system is in a original scale.

4.5.2 Calculation

The next step was to calculate the data for each function according to the Chinese National University Design Code.
## SEVEN MAIN ISSUES OF UNIVERSITY DESIGN

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>FLOOR AREA PER STUDENT (M$^2$)</th>
<th>FLOOR AREA FOR 16,000 STUDENTS (M$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCOMMODATION</td>
<td>6.5</td>
<td>104,000</td>
</tr>
<tr>
<td>CANTEEN</td>
<td>1.3</td>
<td>20,800</td>
</tr>
<tr>
<td>GYM/INDOOR STADIUM</td>
<td>0.47</td>
<td>7,520</td>
</tr>
<tr>
<td>OUTDOOR SPORTS GROUND</td>
<td>0.34</td>
<td>5,440 (2,600×2)</td>
</tr>
<tr>
<td>HALL</td>
<td>2.39</td>
<td>38,240</td>
</tr>
<tr>
<td>LIBRARY</td>
<td>2.3</td>
<td>36,800</td>
</tr>
<tr>
<td>ACADEMIC AND OFFICE</td>
<td>10.2</td>
<td>163,200</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>23.5</strong></td>
<td><strong>376,000</strong></td>
</tr>
</tbody>
</table>

P.S. Since the size of each standard sports ground is 2,600 m$^2$, this school needs two standard sports grounds.

### 4.5.3 Master Planning

“...From nearly every institution’s perspective, land use planning now embraces three necessary programmes: academic, administrative, and residential. For many institutions, the program list has grown to include both recreation/athletics and student service....”

-- David J. Neuman

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Academic, administrative, residential, athletics and student services, these five basic functions cover a normal university’s primary role. However, since library, athletics and student service are all used by everyone in the university to put these functions together into one package, which is called support, is the first step, reducing the number of basic functions to four. The relationship of these four aspects can be shown on the diagram like:

This is why in many universities the canteens, hub, shops, student centre, gym and library are set in the middle of the campus. Then, other functions surround it. This is also my first idea of the master planning. However, bearing in mind the zoning idea for the whole campus, its bow shape, and the number of sports grounds, it would be feasible to divide the site into two parts.

Looking at the picture above, the first question came out was how to relate these two sections. Then, a small centre can be set between two sections.

Proposal 1:

The overall planning is to set a main campus centre, which includes sports facilities, library, canteen, shops and other service functions, in the middle of both sections and a small service area between the two sections. In the north section, the educational area, which
includes academic services and offices, is set on the south side, which is in the middle part of
the campus. The residential area is on the north side, which is closes to the boundary of the
site. The south section is arranged the opposite way – academic services in the north and
accommodation in the south. The thinking behind this is that when the campus is integrated
with the city and accommodation is not just used by university students, the rooms can be
used by the members of the public without disturbing the academic environment.
Discussion:

● The distance between two residential areas is nearly 2 kilometres. If a normal
person’s walking speed is 4-5 kilometres per hour, 2 kilometres will take nearly half an hour
to walk. This mean that these two residential areas are not connected with each other.

● In each section, the distance between the residential and academic area is about 1
kilometre, which is 12-15 minutes’ walking distance.

● The greatest shortcoming of this proposal is that the relationship between the
environment and the campus is not considered in the planning. The noise from main road will
be an undesirable influence on the academic area. To put the sports facility beside the busy
road can create a barrier for the campus but it may cause more traffic pressure for the main
road. The south end accommodation area is such a small land which is surrounded by the
urban civic building, gym and city main road. On the day it is opened and used by the public,
the environment can be difficult to live in.

● In the future, when the service is opened to the public, the location of the middle of
academic area beside the library.

● To put the library and outdoor sports facility too close together is not ideal, since one
is an educational facility and the other is for dynamic activity. However, both of them are used
by all the university and will be used by public in the future.

Proposal 2

Re-package the functions, I then reconsidered the grouping of functions as: academic
(includes office and library), sports facility, accommodation, and service. The reason for this
packaging method is to divide functions by their noise levels and the amount of human
activity. Service and sports facilities are both noisy functions which involve more people
movement, especially of the public. The accommodation may be used by the public in the future, but it still needs a quiet environment. The academic function should be kept in a safe and quiet surrounding, even though library can be accessed by public.

The relationship of these four functions can be shown as:

The main idea is, instead of dividing the site vertically, it should be done horizontally, since the main positive or negative effects come from west and east sides.

Considering the commercial environment of Long Feng Road (west main road), the service (like, commercial) can be put on the west side. It can be a barrier to protect the academic area and it can be easily accessed by public in the future. The sports facilities are placed in the east side, due to their large scale and influence on transportation. Also, because of the beneficial landscape of the river side, to plan a green belt can be useful for both the university and public as a leisure area and a barrier for the campus.

Also, aiming to reduce walking distance, instead of mapping the whole campus by this strategy, it is an attempt to map each block by this method.

Following the Dayuan idea, putting a lower building on the south side enables all buildings to get more sunlight and a better view. Since accommodation buildings are normally lower than educational buildings, in each block the residential area is located in the south and academic buildings in the north.
According to the ideas above, the general plan is as shown in the diagram:

Each block follows the zoning idea. Also, the distance between the two libraries is 1 kilometre. This means, everyone in the campus can reach a library within five minutes' walk.

Meanwhile, what is the second level of the traffic system is built up following this strategy. In such a transport system, every building can be accessed by cars, bicycles and people directly.

Discussion:

The second proposal retains the benefits of the first proposal, and alleviates the shortcomings. With a simple layout of function management, the proposal two can be used for the further development of planning.

4.5.4 Building Form

Every school should have its own special character -- schools are like snowflakes. No two are exactly alike, but each has certain characteristics which are common to all snowflakes.
especially the hexagonal structure. Schools are also like the people they serve. No two people are identical.  

-- C. William Brubaker

To inherit and develop the Dayuan building’s features is the central characteristic of my campus – 30 degree roof, observation deck, long narrow courtyards, and other traditional decorative features.

In particular, the courtyard is a positive feature of the campus plan, both from a security standpoint and for the enhancement of communication. C. William Brubaker also mentioned this in his book, Planning and Design Schools, “Building and site security – Site planning will be influenced by security concerns. Structures around quadrangles, as at Oxford and Cambridge, are easier to supervise, and this makes it easier to plan walls, fences, and entrance gates.”

The forms of courtyard are varied. However, it can be grouped by its shape – □, U, and L.

As the diagram shows, the □ shape, which has buildings on four sides, is the safest shape and the best shape for community. According to the different requirements of different function, the □ shape can be used as the main shape of accommodation and education buildings, since these are the functions which need to be secured. The U shape and L shape are both welcoming shapes. The U shape can be used for educational buildings in which an open configuration is desirable, such as the libraries or some service buildings.

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22 Ibid., P. 51.
4.5.5 Final Master Plan

1. School of Engineering
   Management
2. School of Computer Science & Technology
3. GYM
4. Shop and Canteen
5. School of Civil Engineering
6. Lab
7. Library
8. School of Heat Energy
9. School of Materials Science and Engineering
10. School of Architecture & Urban Planning & School of Art
11. Shop and Canteen
12. School of Mechanical & Electrical Engineering
13. School of Municipal & Environmental Engineering
14. School of Information Engineering
15. Library
16. Shop and Canteen
17. GYM
18. Hotel
19. Entertainment Centre
20. Accommodation

Prepared Land
For residential buildings, the national standard was actually for 8 people per room. However, now 4 people per room is the general standard for university accommodation. So, I calculate 10 m² will be needed for each person. Then, 16,000 students need nineteen buildings of about 40m×40m with a 16m×16m courtyard. Here, I put 21 buildings, for 17,000 students. The reason for uniformity of accommodation buildings is economic. Obviously, to build 20

<table>
<thead>
<tr>
<th>BUILDING</th>
<th>School of Engineering Management</th>
<th>School of Computer Science &amp; Technology</th>
<th>School of Civil Engineering</th>
<th>School of Heat Energy</th>
<th>School of Materials Science and Engineering</th>
<th>School of Architecture &amp; Urban Planning</th>
<th>School of Mechanical &amp; Electrical Engineering</th>
<th>School of Municipal &amp; Environmental Engineering</th>
<th>School of Information &amp; Electrical Engineering</th>
<th>Library (library, self-study room, hall, office)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOOTPRINT (M²)</td>
<td>5950</td>
<td>4410</td>
<td>7860</td>
<td>3330</td>
<td>3480</td>
<td>7710</td>
<td>7060</td>
<td>3090</td>
<td>4150</td>
<td>21480</td>
</tr>
<tr>
<td>LEVEL AVERAGE</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>PEOPLE (NOW)</td>
<td>2000</td>
<td>1500</td>
<td>2900</td>
<td>1200</td>
<td>1200</td>
<td>3300</td>
<td>2500</td>
<td>1000</td>
<td>1300</td>
<td>16000</td>
</tr>
<tr>
<td>PEOPLE (FUTURE)</td>
<td>2500</td>
<td>1800</td>
<td>3500</td>
<td>1500</td>
<td>1500</td>
<td>4000</td>
<td>3200</td>
<td>1300</td>
<td>1600</td>
<td>25000</td>
</tr>
</tbody>
</table>
same buildings is cheaper than to build 20 different buildings from the materials and time costs. Also, all the educational buildings are designed to take at least 20% more than current the number of students. So the university will not need to do any extensions for the next several years.

Convenient

As discussed before, three service buildings and car parks are along the west side. The location of the service building can offer a less than 350 metres distance, which is less than 5 minutes walking distance for everyone in the campus. Also, every person can access library within about 500 metres distance, which is about six minutes’ walk.

Comfortable and sustainable

Every courtyard has a good orientation. Every building can get enough sunlight.

Also to be born in mind is that, in the future, the student numbers will reach about 30,000, and the campus will be accessible by the public, and so it will be necessary not to be restricted to low-rise buildings. Hence, more land can be kept for additional buildings. The prepared land is about 45,000 m$^2$ in size currently and can serve more than 14,000 students in the future.

Moreover, along the west side, more prepared land can be used by service buildings, car park buildings or commercial buildings for both the university and the city in the future.

Transport System

Currently the main transport needs are served by a ring road. The aim is to still keep the requirement of the “forbidden” campus, especially in the educational and residential areas. The other roads are hard surface footpaths or landscape. So, motor vehicles can access every building in the campus, but will not intersect with walking people. However, the spaces between buildings are not only pedestrian, these are able to have roads put on them. So, in the future, when the campus opened, these spaces could be used for other options as required.

4.5.6 Architectural Design

A small block of buildings – School of Architecture & Urban Planning and School of Art and two accommodation buildings– are chosen for further architectural design.
School of Architecture & Urban Planning and School of Art

- Function

  The whole building’s footprint is 7710m\(^2\). It should serve 3300 students currently, and at least 4000 students in the future.

- Building Form

  The building is in a simple “U” shape to create a south facing courtyard as a private communication space. Also, the two wings can be used by each school and the middle part can be shared by both schools.

  The idea of the architectural form is a continuation of the Dayuan idea, with the north higher than the south, the slope towards courtyard roofs, the roofs in different heights or sizes, etc.
● Space

As a building for a design school, space should be formed in a flexible way for both sharing and independent functions. Space from public to private is designed in different areas for different levels.

Also, the classrooms are managed in groups for each year’s students. Each group has a communication space in the middle and classrooms are set around the centre space.

In the book *Planning and Designing Schools*, William Brubaker mentioned that “the space that can be easily adapted to changing needs” is one option for function or user changes or increases in the future.  

In this building, sliding walls are used to achieve this objective. Classrooms can be divided into different sizes according to student numbers. Also, the centre space can be integrated with classrooms when required. At other times, it can be an exhibition space or a big drawing room.

● Courtyard

The design of the courtyard still follows the Dayuan concept, being arranged symmetrically around a rectangular courtyard. The two axes of the rectangle are roads which

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connect with three entrances. The four corners are provided with green plants with seats which can create a community environment.

Water runs around the courtyard at the base of the building. The idea is that the inwardly sloping roofs of the Dayuan can collect water and direct it into the water channel. The water channel also communicates with the river that runs through the site, so that it will not be dry even in the dry season.

The idea of the sculpture wall in the entrance of the courtyard comes from the screen wall opposite or inside the gate of a traditional Dayuan. This also can be a barrier element between public open space and private open space.

- Entrance and Lobby

The centre lobby provides a connection between the outdoor and indoor spaces. Since it is south-facing, green plants can be used here to create a greenhouse environment to reduce over-heating from sun. This big lobby can be a big exhibition space, or even a small museum of the design schools.
School of architecture and urban planning and school of art
Accommodation Building

● **Shape**

The accommodation building, and continues the Dayuan concept. It is in an “回” shape which can maintain privacy and safety for residents.

● **Plan and Function**

The planning is simple and functional. All the rooms together are arranged in a “口” shape to surround the courtyard. The whole building has 198 rooms and can take maximum of 792 students.

● **Façade**

The idea of façade design is from the window pattern of a Dayuan. Also, the louvre becomes one element of the pattern.
• Entrance

The entrance design idea is from the doors of a Dayuan which are in different layers to separate space.

• DRAWINGS:
WEST ELEVATION
5. CONCLUSION

5.1 CRITICAL APPRAISAL

5.1.1 Analysis of Design Process

The design process is in two stages.

To find how to solve the problem of Chinese universities by investigating the good examples set by developed countries, and then to compare with the examples of Chinese universities is the first step. I believe that the answer lies in the integration of the university campus with the city.

The second stage is to find how we can integrate Chinese universities with their cities with a real university campus design.

The site chosen is also evaluable. It is a general site which avoids special situations. Hence, the design process and conclusion can be popularised.

The study of national design codes and how they are interpreted are included in the design process as a real process of the planning project.

The design concept – Dayuan – comes from the local culture. It can be viewed as a cultural link with city. Seen another way, it creates a way of looking towards, and into, the city. Also, as a classical issue, it is necessary to study its characteristics. Then decide what can be retained and how it can be adapted to modern conditions.

Research is not a one stage job in this design process. During the project development, research is always helping to lead or modify or evaluate the work.

The whole design process is quite different from normal campus planning, but with the same aim, which is to create a good learning environment. It can be seen that the design process is mainly successful. To integrating the campus with the city with its cultural link, its transport system connection, and some change of its function and space design, the question can be answered.

5.1.2 Project Outcomes

- To integrate the university into the city as a whole is a possible line of development of university campuses in China from an architectural perspective.

Through investigating the background of these problems in China, and the manner in which other advanced countries have handled them, one will surely find that the changing
nature of universities, the development of the economy the expansion of cities and populations, and the importance in the society of education, all go hand in hand. China is currently experiencing this.

Also, studying the ways in which advanced countries have handled these problems, it may be found that the answer to the question is that Chinese universities need to open their campuses and integrate with their cities.

- Design a university campus that can be built now and still meet future needs as the city grows outwards to meet it.

China has its own situation of educational background and design rules. Since the project needs to be built now, it should be designed in accordance with the current design codes and economical and social environment. Therefore, the campus cannot yet be fully opened to the city. However, foreseeable future changes should be borne in mind, including the tendency towards integration, and the campus should be designed accordingly. Hence, there are three types of issues to consider in the new campus design: issues of complete change (opening the campus up to the public), issues of partial change (opening the student buildings and spaces up to use by both students and the public), and unchanging issues (the facilities that will remain for student use only). Also, unlike the traditional large scale zoning design, the small scale zoning plan is more convenient for people to use. For future rises in student numbers rise in the future, the prepared space in the buildings and prepared land are both necessary.

- Architectural design for one or two buildings following the same design concept

The design concept is the use of local classical architecture. The outcome here is the incorporating the concepts of classical architecture into modern architectural design. The design should not only include the characteristics of the Dayuan, but also take note of the rationale for its special features. Then, following these principles, the building can be designed to modern standards retaining the classical concepts.

- Good balance between public and private space of a campus and a quality living and learning-oriented environment for students.

Once the campus is opened to the public and people can walk into the campus, some of the space in campus will be not private any more. Therefore, to design space in different
levels from public community to private communication to private learning can meet people’s various requirements. Also, instead of boring corridor space of classroom design, a communication space can be a good core of organising a group of classrooms to provide a space for talking, relaxing and getting in touch with nature. The flexible space is able to provide a sustainable design issue for future needs.

5.2 CONCLUSION

The goal of this research project is to find a possible way to solve the problems of university design in China based on the current situation and special background in China. Then, having done this, to design a campus with a good learning environment and allowing sustainable development, thereby to prove the practicability of the finding.

The very important finding is that, Chinese university campuses will be integrated with the city as a part of the urban environment. With a real campus design, I have shown here that it is possible to design a campus which can be built now within the constraints of the national design code and other current conditions and will be integrated with the city, in the near future, by view connection, transportation connection, space transition, providing for mixed functions, and prepared space. Also, a good, flexible, and comfortable learning environment can, and should, be created with this concept in the campus.

I believe the project design is a satisfactory and feasible answer to my research question, and the thesis does have universal applicability to other campus designs in China.
6 BIBLIOGRAPHY


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