

Exploration of Online-Offline Mixed Teaching Mode of Green Building Course for Foreign Students in Universities in Northwest China

Juan Ren^{1,*}

¹ The School of Architecture, Chang'an University, Xi'an, Shaanxi, China

*Corresponding author. Email: juanren@chd.edu.cn

ABSTRACT

With the expansion of foreign student enrollment in recent years, the education of international students in China has become an important part of higher education. This paper takes the teaching of green building course for foreign students majoring in architecture in Chang'an University as an example, and makes diversified innovative explorations from the aspects of course system, teaching content, online-offline mixed teaching methods, teaching team and assessment mode, combining with the differences of foreign students' background and language ability. It aims to promote the construction of courses for foreign students with both international vision and Chinese characteristics, in order to provide useful reference for the guarantee of teaching quality for international students majoring in architecture.

Keywords: Online-Offline, Green Building Course, Foreign Students, Northwest China.

1. INTRODUCTION

Nowadays, the education of international students has become a significant part of China's higher education, but also a symbol of the construction of world-class universities. The education of foreign students in China is an important mission and foundation for higher education to comprehensively support "The Belt and Road Initiative" progress.

At this stage, international students from universities in northwest China mainly come from developing countries and regions along the Belt and Road, such as South Asia, Central Asia and Africa. As the background color of "The Belt and Road Initiative", green building as part of efforts to achieve carbon peak and neutrality goals is crucial subject in the field of architecture in the 21st century. The sustainable concept advocated by green building promotes the learning enthusiasm of international students, especially those majoring in architecture.

"Green Building" is an important compulsory basic course for international students majoring in architecture of Chang'an University, which plays an important role in the professional training and discipline construction for international students. Therefore, it is urgent to combine the development background of the times and the

characteristics of international students to explore and innovate courses related to green building.

2. CHALLENGES OF CURRICULUM CONSTRUCTION

Due to the great difference in professional knowledge background and learning expectation of international students, as well as the great difference in construction industry in different countries and the continuing impact of the global COVID-19 epidemic, the teaching of green building course for international students has brought some challenges:

(1) International students have different professional backgrounds and some of them lack related knowledge reserve. Restricted by the differences of the national education system, students are uneven in the original background knowledge education, and their knowledge frameworks are obviously different. In hence, it is difficult to international students fully understand and master the knowledge from class.

(2) Due to the great influence of national economic-technological level and social-cultural background on the development of green building, international students from different regions have multiple learning needs for the course.

(3) At present, there are few self-written English textbooks for international students in China, which is not conducive to students' in-depth and systematic learning. Compared with the relatively systematic and comprehensive Chinese textbooks related to green building in China, the current English textbooks related to green building have higher theoretical differentiation. According to the various situations of students, teachers often need to comprehensively explain the knowledge points of different chapters in multiple books in actual teaching, and the textbook price is relatively expensive, which has a certain impact on the all-English teaching of this course. At the same time, there are relatively few green building standards available in English in China, and the corresponding revised and updated English version is obviously lagging behind, which brings a lot of translation work to the English teaching of the course.

In this context, it is of great importance and necessity to optimize the teaching system of the green building course for international students and to find a teaching method that can adapt to the current training objectives of international architecture students in northwest universities.

3. PREVIOUS STUDIES

In the aspect of green and sustainable building education, a lot of universities have made a positive response to the comprehensive promotion of green building transformation and has started a lot of exploration. At present, architectural education in the direction of green and sustainable development has been set up in large-scale universities around the world. For example, the School of Architecture of Massachusetts Institute of Technology (MIT) combines architectural design courses with building technology topics, and specifically integrates green sustainable concepts and technical methods into the design teaching process [1]. The School of Architecture and the Environment at the University of Nottingham in the UK has combined architecture with other disciplines to create a dedicated sustainable architecture degree [1]. In China, Architecture School of the Chinese University of Hong Kong combines architecture with green design in a vocational training mode to realize the diversified development of architecture education. In addition, Southeast University [2], Chongqing University [3] and other universities are also actively exploring green building and architecture education [4].

Above all, the current hybrid teaching mode in northwest China for university students of the green building related courses construction exploration is still belongs to blank. It needs to embark from the practical problems in systematic innovation exploration of the green building related courses, focus on both international perspective and Chinese characteristics of

the informatization construction of curriculum content, and accelerate course with high level development.

4. EXPLORATION OF INTERNATIONAL CURRICULUM CONSTRUCTION

In setting the training objectives of green building course, it is necessary to fully consider the basic characteristics of the international students in northwest universities, such as their significant differences in professional background and career environment after graduation, as well as the objective conditions such as their cross-cultural adaptation ability in another language environment, and respect the customs and religious traditions of international students.

The curriculum should be oriented to cultivate high-level, compound and international specialized technical talents with strong cross-cultural communication ability, innovative spirit and broad international vision, and further set up training objectives.

As one of the compulsory courses of architecture major master students, green building course teaching needs not only to achieve the basic requirements of training plan, but also to highlight the regional climate adaptability design and passive/active technologies, which based on different background knowledge to international students. In the teaching process, teachers strive to make the classroom content vivid and substantial through the means of online and offline mixed teaching. The establishment of the teaching team needs to gather teachers with excellent professional and English ability to join, and carry out cooperation and discussion with famous teachers from overseas universities, laying a foundation for better training of international students majoring in architecture.

Based on the reference and absorption of relevant research results, combined with the online and offline mixed teaching and the learning characteristics of overseas students in universities in northwest China, this paper carries out innovative research on the curriculum construction of green building which related international students. The main research objectives include two aspects: First, to optimize the diversified teaching systems and contents of green building course in English, laying a good foundation for the construction of high-level architecture courses with international and Chinese characteristics. Second, through the practice and summary of the teaching methods to be adopted in the course, the practical experiences are extracted and summarized, so as to provide useful reference for promoting the development of relevant courses for international students majoring in architecture in universities in northwest China.

The framework of course contents:

(1) Clarify the teaching objectives of international students. Teachers should clarify the teaching tasks of

green building-related courses in English, determine the teaching content and make reasonable teaching plans based on the actual situation of international students' cross-cultural learning, so as to standardize the teaching process.

(2) Update the mode of online and offline mixed teaching methods. Teachers need to make full use of high-quality online teaching resources, pay attention to the interdisciplinary and integration, on the basis of strengthening theoretical teaching, supplemented with architectural design practice to consolidate knowledge points learning. The proportion of interactive teaching led by overseas students should be increased in class, and the "Internet +" teaching concept is used to provide targeted guidance to international students, stimulate their interest in learning, and improve the quality of study.

(3) Establish an online and offline international mixed teaching team. The teaching team needs to take this course as the core and form a joint force with other professional courses, to let international students can master the knowledge of Chinese industrial laws/regulations, technical requirements and traditional culture as soon as possible. At the same time, depending on the overseas scientific research background of relevant teaching team members, the course can invite teachers from famous overseas universities to give online special lectures or teaching guidance, so as to promote the construction and development of online and offline mixed teaching team.

(4) Highlight course content with both international perspective and Chinese characteristics. In the curriculum, teachers need to broaden students' academic horizons, timely introduce the latest international scientific research achievements, as well as Regulate English expression. In combination with relevant codes and examples of green building design at home and abroad, the teaching contents should highlight the building technology and cultural characteristics of China, and promote the internationalization and characterization of green building courses in English.

(5) Improve the student assessment mechanism. This course can adopt a cumulative assessment method, which divides the course grades into regular attendance, class performance, seminar, competition participation and final course paper. In order to achieve the purpose of urging international students to learn in the process of online and offline mixed teaching, students should be strictly restrained in class discipline and strengthened in the learning process and problem solving ability.

5. PROPOSED CONSTRUCTION METHODS

5.1. The diversity of international students' professional backgrounds in northwestern universities is one of the

difficulties in the current English green building course teaching. Based on the connotation extension and interdisciplinary characteristics of green building, teachers should fully introduce the functional positioning, role, importance and necessity of green building, and make diversified explorations in teaching methods as follows:

5.1.1 Online and offline feedback teaching mode based on "Internet +"

The "Internet +" teaching concept is used to break the geographical restrictions of teachers and students, and strengthen the "point-to-point" teaching to help students with weak foundation [5]. Pay attention to improve the course feedback system, teachers make full use of QQ group, Wechat group, online learning platform and other interactive communication functions, students can discuss specific course content in the group, teachers give reply and timely adjust the problems in teaching. Using the relevant online course platform, teachers can supplement and update the latest scientific research achievements and examples, enrich the teaching content, and facilitate students to understand the new trend of industry development.

5.1.2 Problem-oriented teaching mode

In view of the characteristics of international students, such as broad thinking, strong curiosity and inquisitiveness, and active questioning, teachers can adopt problem-oriented teaching methods to promote their learning efficiency. First, let the students preview with questions, and then explain the difficult and important questions raised by them, so as to change the one-way knowledge transfer into interactive communication and discussion.

5.1.3 Reversed topic teaching mode

Encourage students to become teachers in classroom presentations. Before class, the teacher drew up relevant topics related to green building and asked students to study by themselves firstly, including searching for materials and literatures, discussing and making PPT and explanation. In this way, students can not only improve their ability of active learning and teamwork, but also improve their ability of consulting and summarizing literature, corporation of teamwork, scientific presentation, etc.

5.1.4 Improve the quality of learning by participating in competitions

Architecture major is a discipline with strong innovation and practice, and discipline competition is an important link and a powerful hand to test teaching achievements and improve students' innovation ability.

In the course teaching, teachers encourage and guide students to actively participate in international design competitions related to green buildings, stimulate their interest and potential, and cultivate their scientific research ability and innovative spirit. Competition can also promote students' sense of teamwork and improve their practical ability to comprehensively apply the principles of classroom knowledge to design. At the same time, teachers can guide students to participate in the topics research around the competition, and constantly promote the reform of teaching content and methods.

5.2. Referring to the teaching experience of many famous universities abroad, the course can follow the principle of setting up open course materials, refer to classic textbooks and high-quality resources at home and abroad, introduce high-quality online open courses and other relevant teaching materials of international famous universities, and optimize the independent courseware.

In addition, relevant references are provided for students according to the specialty characteristics of this course. In particular, China's national and industrial standards, such as "Assessment Standard for Green Building GB/T 50378" shall be added into the learning content of international students. In view of the current lack of English version of the standard rules, teachers can choose syllabus related content to translate into English courseware. In the introduction part of great architectural examples, teachers can select representative green building examples of various countries and explain corresponding green design strategies and technical principles in combination with climate, environment, resources, economic and social development of regions.

5.3. The curriculum should emphasize teaching team building and cooperation. The course construction should be completed by the teaching team, including the regular course seminar, giving full play to the advantages of teachers in the teaching team, updating the international representative green building design examples and the latest scientific research results in real time, and supplement and improve the courseware. At the same time, relying on the international cooperation platform of the university and the overseas scientific research background of the teaching team, through ZOOM, SKYPE, Tencent Conference and other online conference platforms, teachers from famous overseas universities shall be invited to give lectures or teaching guidance on relevant topics, so as to promote international cooperative teaching.

6. CONCLUSIONS

Under the background of the urgent demand and construction of green buildings in the development strategy of the "Belt and Road Initiative", the green building courses for international master students shall

focus on the various students' professional backgrounds of universities in northwest China, and emphasize the construction of courses with international vision and Chinese characteristics. Green building-related courses can be innovated and explored in a variety of ways from course system construction, online and offline mixed teaching methods, textbook construction, teaching team and assessment mode to promote the internationalization, specialty and high-level development of courses.

ACKNOWLEDGMENTS

This work was supported by the International Education and Teaching Reform Project of Chang'an University (No.300108211038) and Shaanxi Social Science Major Theory and Practical Issues Research Project (2021ND0442).

REFERENCES

- [1] J. Huang, X. Shen, H. Liu. The Integration of Architecture Design with Architecture Technology: Analysis of and Inspirations from the Architecture Education in the UK and USA [J]. *New Architecture*, 2014(1):144-147. DOI:10.3969/j.issn.1000-3959.2014.01.034.
- [2] W.J. Yang, B. Xu, Z.H. Wu. Inheritance, Development, Interdiscipline and Integration: A Study on the Green Building Education System of Southeast University [J]. *New Architecture*, 2015(5):113-117. DOI:10.3969/j.issn.1000-3959.2015.05.024.
- [3] Z. Li, Z.P. Liu, F. Fang, et al. Teaching Practice of the Full English of Water Supply and Drainage System in Buildings for Foreign Students [J]. *Journal of Architectural Education in Institutions of Higher Learning*, 2012, 21(2):58-62. DOI:10.3969/j.issn.1005-2909.2012.02.015.
- [4] D.Y. Li. Exploration on the English — Language Teaching of "Building Architecture" for International Students Under the International Background [J]. *Journal of Green Science and Technology*, 2021, 23(15):236-239. DOI:10.3969/j.issn.1674-9944.2021.15.069.
- [5] Setyawan H. Blended Method: Online-Offline Teaching And Learning, On Students' Reading Achievement [J]. *English Education Jurnal Tadris Bahasa Inggris*, 2019, 12(1):22-33.