Thinking and Practice of International Curriculum Cooperation in Post-Epidemic Era

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Abstract: In the post-epidemic era, the internationalization of higher education is facing new missions, new challenges and new problems. How to carry out Internationalization at Home to promote international talent cultivation is an important issue that needs to be explored in the post-epidemic era. Benefiting from the rapid development of computer and network technology, online teaching has become a popular teaching method adopted by most universities under the epidemic situation. A novel online teaching model for international curriculum cooperation is proposed in this paper, to ensure the stable operation of international education cooperation programs and promote the cultivation of international talents under the epidemic situation. To ensure the smooth implementation of international online courses, multi-party collaborative teaching operation mechanism and professional teacher assistance mechanism are designed in the teaching model. We have proved the validity of the proposed teaching model through practices on the international course of web crawler design.

Keywords: International curriculum cooperation, Internationalization at home, Post-epidemic era, Sino-French engineer class, Internationalization of higher education.

1. Introduction

Internationalization of higher education is not a new product. As early as the establishment of European universities in the middle Ages, there were people who traveled in various countries to receive higher education[1]. Since entering the modern society, with the development of economic globalization, the continuous progress of science and technology and the gradual establishment of international relations, the international cooperation and exchange of higher education is booming. Although the unstable and uncertain factors of international relations have slowed down the process of world globalization, it will not fundamentally change the inevitable trend of the development of global cooperation. The globalization landscape will not change, and it urgently needs the cultivation of a large number of international talents.

Recently, the outbreak of the new coronavirus pneumonia (here in after referred to as the "COVID-19" or "epidemic") affects higher education, economic development and the world the lives of people everywhere. The internationalization process of global higher education is facing unprecedented challenges. International students cannot return to campus or return home, and many study abroad programs have been canceled. The epidemic leads a downward trend in global student mobility, with the largest decline coming from China. It has temporarily reduced the scale of Chinese study abroad, and at the same time has basically ended the overseas study boom of Chinese students in the past 20 years[2].

At present, due to the continuous impact of COVID-19, cross-border internationalization is unsustainable. Internationalization at Home (IaH) is an effective way to promote the internationalization of education. The concept of IaH was first proposed by Bengt Nilsson[3], vice-chancellor of Malmö University in Sweden in the 1990s. It refers all activities related to international affairs other than overseas mobility. Once the idea was put forward, it attracted widespread attention of scholars. It makes international education no longer limited to the cross-border flow and exchange of personnel in physical space in the narrow sense, but focuses on the means of localized talent training for all students[4]. Nowadays, with the rapid development of computer and network technology, students have been able to connect with teachers and students in other countries through information technology[5] when taking classes in their own countries. This makes it possible for IaH online in the post-epidemic era.

This paper studies the localization of international curriculum cooperation. Before the COVID-19 outbreak, most of the international curriculum cooperation took the form of students going abroad for courses or hiring international teachers to teach in colleges or universities. Due to the impact of the epidemic, this traditional form of international curriculum cooperation is no longer feasible. In order to promote the stable development of international education programs in colleges and universities, continue to cultivate international talents, we propose a novel online teaching model of international curriculum cooperation and demonstrate its effectiveness through practice on one international course of "Web Crawler Design". Details are given in the following sections.

2. A Novel Teaching Model of International Curriculum Cooperation

This section presents a novel online teaching model of international curriculum cooperation. Overall, it mainly consists of two parts, as shown in Figure 1 and Figure 2. The first one is a multi-party collaborative teaching operation mechanism, which is designed to ensure the stable operation of online international course cooperation. The other is online teaching model designed for guarantee the quality of teaching.
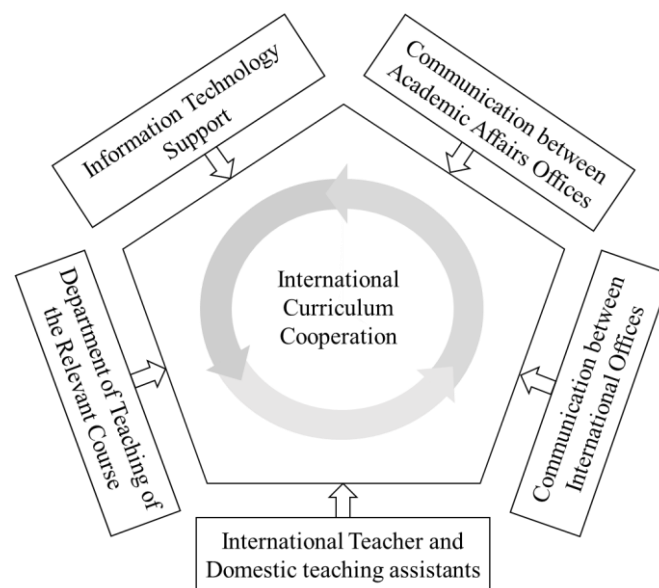

Figure 1: Multi-party collaborative teaching operation guarantee mechanism.

As shown in Figure 1, we propose a five-party collaborative curriculum operation guarantee mechanism:

▪ For international curriculum cooperation, we first need the international office to coordinate domestic and foreign cooperation projects and cooperation content.

▪ Then, academic affairs office plays an important role in the course arrangement, including the allocation of course teachers, the arrangement of the ways and locations of classes.

▪ Once the online teaching is determined, the information technology department is required to provide technical support, including the Internet traffic of students and teachers, online teaching software, etc.

▪ Next is the main responsible department of the course, usually the teaching department, to clarify the course syllabus and teaching requirements.

▪ The last part is the communication and exchanges between the international course teachers and the domestic professional assistant teachers.

We think all the five parts are indispensable, especially the domestic professional assistant teacher. It is necessary to arrange professional course teachers to provide teaching assistants for international cooperation courses. On the one hand, it is necessary to communicate with international teachers in advance to confirm that the teaching content and arrangement meet the course requirements. On the other hand, professional teachers are helpful to coordinate effective communication between international teachers and students to avoid the decline of teaching quality caused by language problems. Next, we

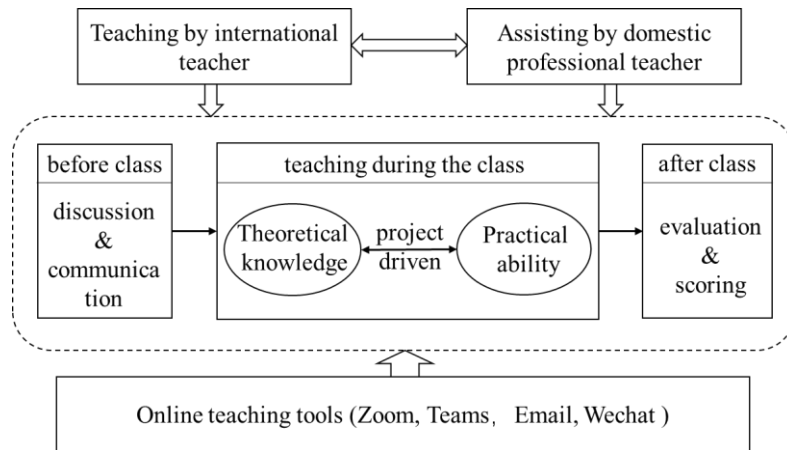will introduce how to ensure the quality of course teaching through teaching assistants.

Figure 2: Online teaching model of international curriculum cooperation.

As shown in Figure 2, on the basis of sufficient online teaching technology support, an online teaching management mechanism is designed for professional teachers and international teachers to ensure the quality of online teaching. This management mainly includes three parts: before class, during class and after class.

▪ Before the start of the course, teachers at home and abroad have used online video conferences and emails to fully communicate and exchange in terms of teaching objectives, teaching content, project design tasks, and course assessment. On the other hand, it helps domestic curriculum in colleges and universities to be in line with international standards, and promotes curriculum construction and professional construction.

▪ Based on sufficient preparation in advance, international courses can be implemented During this time, international teacher and assistant teacher should pay attention to linking theory with practice and use appropriate teaching methods to carry out online teaching, including case teaching, online exercises, online Q&A, group discussions, etc., to ensure the improvement of students' knowledge and ability.

▪ After the course, teachers at home and abroad will evaluate and grade the students together. On the one hand, it aims to ensure that the course meets the school's filing requirements and that the evaluation is objective and reasonable. On the other hand, the comprehensive teaching assistance and course follow-up can help us learn the advanced experience of foreign curriculum management and improve the quality and management level of domestic courses.

3. Practice on the Course of Web Crawler Design

In this section, we take the web crawler design in the Sino-French engineer cooperation project of Beijing Institute of Petrochemical Technology (BIPT) as an example, to show the effectiveness of the proposed teaching model designed for international curriculum cooperation.
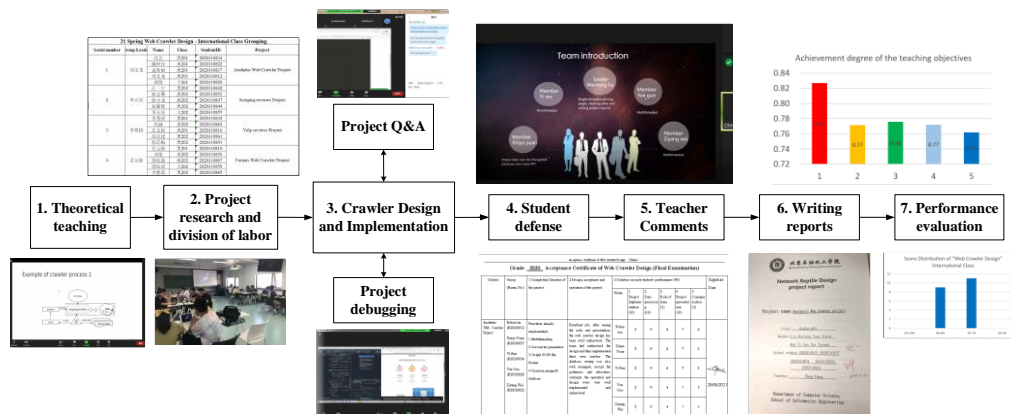

Figure 3: Implementation of web crawler design course using online international cooperation model.

Drawing on the advantages of French engineering education, BIPT has cooperated with Efrei Paris to establish the "Sino-French Engineer Class" since 2017, to cultivate international talents in the direction of big data and artificial intelligence. The Sino-French class project has also been affected by the epidemic. In order to ensure the stable operation of the project, we use the proposed new online teaching mode for international courses in the project. "Web crawler design" is one of the international cooperation courses. It is a 2-week practical course, taught by a French engineer on the front line of the enterprise and assisted by a Chinese professional teacher. The course execution process is shown in Figure 3.

▪ At the beginning of the course, the French teacher first introduced the basic knowledge of web crawlers, then assigned project tasks.

▪ Then, students conducted research and division of labour according to the project task.

▪ Next, students carried out crawler design and implementation. The French teacher answered questions in real time and worked with students together Debugging problems.

▪ At the end of the course, students made a course defense to their web crawler project.

▪ The French teacher made comments for each group.

▪ For the final score, the students were needed to write a project report.

▪ Finally, the teachers from China and France cooperate to give the final scores of each student.

Course assistant followed the whole course, coordinated and processed with possible communication, progress, quality and other issues. After the course is over, the teaching assistant and the foreign teacher filed and summarized the course together. Based on the idea of outcomes-based education[6], the course is designed and implemented in accordance with the principles of engineering education certification. The degree of achievement of teaching objectives is shown in Figure 4.
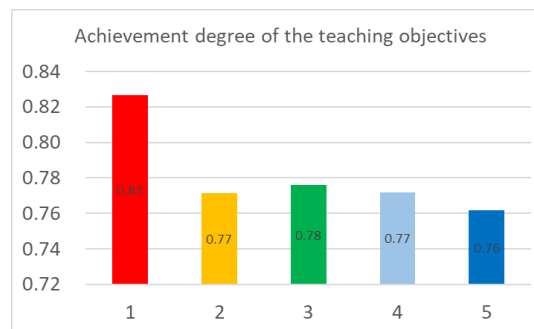

Figure 4: Calculation results of degree of teaching objective achievement.

The course has 5 teaching objectives, among which objective 1 focuses on the training of design ability, objective 2 focuses on project implementation and data processing. Objective 3 focuses on teamwork; Objective 4 is to develop effective communication and communication skills on complex engineering problems. Objective 5 focuses on the improvement of cross-cultural communication skills and international vision.

From figure 4, we can see that achievement degree of objective 1 is the highest (0.83), indicating that students have better mastered the ability of analyzing, designing and implementing web crawler through course learning and practice. The lowest (0.76) is in objective 5, showing that students' cross-language communication skills were needed to be further improved. The lack of cross-language communication skills might lead to inadequate communication with industry professionals on complex engineering issues (Objective 4), and influenced project implementation (Objective 2). In addition, the achievement degree of objective 3 is 0.78, indicating that communication and solidarity among project team members needed to be further strengthened. In general, online international courses have achieved good teaching effects. However, there are still some problems worthy of attention and improvement. It is beneficial to the continuous improvement of online international course teaching through the timely summary of Chinese and French teachers after class.

4. Conclusions

Based on the urgent actual needs of internationalization education in the post-epidemic era, this paper proposed a new online teaching model for international curriculum cooperation. A multi-party

collaborative teaching operation mechanism is needed to guarantee the stable operation of the online international courses. An online course assistance mechanism is proposed to ensure the teaching quality, which is also conducive to the exchange of curriculum teaching at home and abroad. Finally, an application example of the proposed model is given, showing the effectiveness of the proposed method in international curriculum cooperation. The proposed method also has good portability and has been popularized and applied in other courses in the international education project of "Sino-French Engineer Class" between BIPT and Efrei Paris.

References

[1] Hu, Y., Fan, L. (2021) Research on the Risks and Avoidance Strategies of the International Development of Higher Education in the Post-epidemic Era. Higher Education Exploration, 5, 12-19.

[2] Liu, J., Gao, Y., Altbach, P. G., and Vit, H. D. (2020) Altbach on the impact of the new coronavirus pneumonia on the internationalization of global higher education. Modern University Education, 6, 31-38.

[3] Nilsson, B. (2003). Internationalisation at home from a Swedish perspective: The case of Malmä. Journal of studies in International Education, 7(1), 27-40.

[4] Cai, Y. (2021) Internationalization at Home: An Imperative Research Field in the Post-epidemic Era. Research in Educational Development, 3, 29-35.

[5] Xiao, M., & Yi, H. (2021). An Efficient Teaching Model of International Cooperation Based on Artificial Intelligence. Scientific Programming, 2021.

[6] Spady, W. G. (1994). Outcome-Based Education: Critical Issues and Answers. American Association of School Administrators, 1801 North Moore Street, Arlington, VA 22209 (Stock No. 21-00488; $18.95 plus postage).