

A Co-training Mode for Civil Engineering Majors under the Context of Chinese High-speed Railway Internationalization

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Abstract — China's high-speed rail internationalization has increasingly developed, but the quantity and quality of professional translators are far behind what's required and needed. In order to solve this problem, a co-training mode of cultivate translating talents was proposed. In this paper, the key factors related to training the translation talents of international Civil Engineering (CE) students in Shijiazhuang Tiedao University (STDU) were analyzed, and a framework for a co-training mode of education for CE international students was constructed based on the analysis and investigation. Subsequently the Chinese language proficiency test, Hanyu Shuiping Kaoshi (HSK 4) results before June 2015 and the employment rate of STDU 2014 were collected. Results demonstrate that the co-training mode between the university (STDU) and overseas railway engineering companies plays an important role in the improvement of professional translation talents. Finally, The new mode of education has proved to be a win-win situation both for the university (STDU) and China Railway Engineering Corporation (CREC) by listing the benefits to both sides, and is helpful to solve the deficiency of professional translation talents in China's high-speed railway internationalization..

Keywords - *co-training mode; Civil engineering; Translation talents*

I. INTRODUCTION

In the past few decades, China's high-speed rail technology has become increasingly mature, with the successful completion of a large number of high-speed railway construction projects abroad. Some large-scale engineering contracting enterprises, such as the China Railway Construction Corporation (CRCC) and the China Railway Engineering Corporation (CREC) have gained huge amounts of international market share with competitive power and scale. Prime minister Li Keqiang actively promotes China's high-speed rail technology at every international trade conference with the heads of the UK, Romania, Thailand, Ethiopia etc. Therefore, the high-speed railway has become the trump card of China, and is stepping into an era of rapid development.

Professional language translation is the first challenge for the internationalization of high-speed railway development, and therefore those individuals who are excellent in both language translation and technical expertise are highly sought-after. Unfortunately, foreign language education in China is still unable to get rid of the awkward situation of 'dumb English, Chinese style English', even though the Chinese government has invested a lot of manpower, material and financial resources for addressing this problem for the past 30 years. A research from 'EF English First' shows that the English capacity of Chinese people has been pushed down 10 places to 47th in a group of 70 countries in 2015, and is even lower than Latin American countries such as Brazil, Mexico, Costa Rica and Guatemala. As for the proficiency level of Engineering English, there is no advantage at all compared to major competitors from

developed English speaking countries. Even now, Chinese companies cannot find a complete China's High-speed Rail Standards in English, so they usually have to translate it by themselves without any compliance. As a result, the translation errors and misunderstandings make the clients taken aback and even cause the program to lapse[1].

II. STUDY OF CO-TRAINING MODE ON CE INTERNATIONAL STUDENTS

A. Study of Talent Cultivation Objectives

Compared to Chinese students, International students majoring in Civil Engineering (CE) are much better in the English language and are more practical in cultural context and social background. If equipped with solid a language translation foundation, professional quality, engineering practical exposure, competence in innovativeness and internationalization, the international students are capable of effectively engaging in work related with international railway construction, and their distinct advantages can be found.

B. Construction of Professional Translation Ability Training System

The key factors contributing to CE students' learning efficiency are learning environment, teaching quality and educational resources [2].

Learning environment: There is a significant advantage for international students to improve their Chinese language in a native language environment which can provide an exceptional expediency to improve their Chinese language application ability. It has become widely accepted that the rich and vivid language resources from the social environment in the target language can help learners obtain a successful and faster language acquisition and leap from knowledge to ability, from accuracy to appropriateness, from shallow to deep[3]. Also, it is making use of this advantage that the students complete the transformation from their mother tongue to the target language through the social environment and contiguous vivid language resources. In this way, the co-training mode can bring about an organic combination of the content of language communication in engineering applications and the idea in language education in the university.

Furthermore, the atmosphere of learning Chinese for CE students is established by integrating the classroom study with the co-curricular activities. The co-curricular activities include Chinese language corner for CE students on-campus, organizing international conferences and engaging in Chinese debates on related subjects. Optimizing better language learning contexts on-campus for the CE students stimulates the students' enthusiasm and passion to learn Chinese.

Qualified teachers: To reach the level required in professional expert translation, qualified teachers are quite necessary. The currently involved university teachers are mostly rich in theory but short on engineering experience. This problem can be solved by introducing professional personnel from the China Railway Engineering Corporation (CREC) to the class. Their specific contribution would be in the following ways:

- 1) They offer their rich experience and bring typical cases for study to the class. The intervention of professional and technical personnel from the company CREC in the process of foreign student education will effectively make up for qualities lacking in the teachers in colleges and universities.

- 2) A training module can be opened for the university teachers. The co-training mode can open up and explore avenues for the teachers to acquire more practical experience and update their expertise. Meanwhile, CREC can also provide the environment for the university system to experience real business talk and contract signing.

- 3) Shorten the learning cycle of international student education. The foreign students usually have to spend a long time in language transformation. This could be attributed to many factors including poor motivation, lack of competent guidance and a solid context for practical application. The intervention of CREC in the curriculum helps the students avoid detours in the process of Chinese language learning and significantly shorten the time of learning.

Learning resources: During the period of basic language study, it proved to be very successful to put some Chinese

students majoring in English in the international students' language class, especially in oral and listening class. The mingling of the Chinese students and foreign students was found to be synergetic and mutually beneficial. To become a professional translator, the international student needs more opportunities to experience specialized text translation. The video samples of historical business talk and text translation which could be made available by CREC provide excellent directional guidance for CE students in language learning, and play an important role in helping them make the leap from basic Chinese proficiency to professional translation.

C. Construction of Cross- Culture Training System

Culture might be described as a blueprint for instructing an individual's behavior in a group of people, and it can also be defined as the opinions, conventions, abilities, and so on that characterize a group in a certain period of time [4]. Communication among people with different cultural backgrounds can easily lead to misunderstanding if both the speaker and listener lack the other's cultural knowledge. So cross- culture training is proposed to carry out as follows:

Cross-cultural education by means of Multi-media and Internet. Multi-media CDs make the teaching assignments more vivid and lively by combining the sounds, pictures, scripts and animations, which acclimatizes the students' interests and memories with a different culture. Computer-assisted assignment drilling and checking enables students to do the required tasks more than once and get corresponding feedbacks. They can self-examine their own problems and adjust the degrees of difficulties in learning and then protect their sense of achievement[5].

Networked instruction provides students with virtual classes. Teachers' lecturing and students' learning can be carried out in indefinite places with efficient communication and interaction between teachers and students or among students only. In designing the network courseware, both teaching and learning are taken into consideration, providing students with learning assignments, and teachers with technological tools for assignment checking. This teaching method helps students acquire knowledge openly, interactively, cooperatively and independently, which is a necessary component for in-class teaching of English for Civil Engineering [6].

Cross-culture education by means of experience. Cultural communication emphasizes the cultural factors hidden in communication. So those who learn Chinese as a foreign language must be guided in order to avoid cultural misunderstandings. The cultural factors that affect communication can be found in many aspects, such as national values and orientation; food and clothing; customs, aesthetic taste; moral norms, lifestyle and thinking patterns. The type of experience-enriching teaching involving cultural exposure, stimulates the enthusiasm of the foreign students, and motivates them to encompass a deep understanding of the different culture [7]. The experience of different cultures

makes the students acquainted with their diverse ways of thinking and expression, which is quite indispensable for the students to use the language correctly.

Cross-culture education by means of typical cases: Under the joint training mode of education of international students, the engineering company can provide many typical cases for the contextual cultural teaching imparting cultural knowledge and guidance for avoiding cross-cultural conflicts effectively in order to achieve successful communication. The typical cases help the international students in the following aspects:

1) The cases help students have a full understanding of the complexity of international engineering involving cross-culture projects. Through the cases, the students get to know how to respect the habits, customs and lifestyle of both sides. They help to eliminate misunderstandings in cross-cultural communication and to avoid prejudices and rash judgments. They also help them to accept the thinking patterns within different cultural contexts and become tolerant to habitual emphasis that different cultures place on their own values and standards.

2) They enable the students to understand and accept the behavior of different cultural groups, and make objective and accurate evaluation of different cultural behavior.

3) The cases help students make a rational analysis as to the causes and effects of cultural conflicts. The students can improve their awareness of cultural conflicts, and develop a strong ability of cultural identification and adaptability.

4) They enable students to become exposed to the various issues of values, customs, laws and regulations of both sides which would be of utmost importance in developing a feasible strategic plan.

D. Construction of Professional Internship Platform

School education is a process of accumulation of professional knowledge. But in a real challenging professional environment, knowledge alone doesn't suffice. Hence the construction of a platform for molding the students' knowledge and ability to function in the context of day-to-day professional life complexities is of prime importance. This platform will help them to identify the gaps and constantly improve to finalize the transition from learning to application. The mode will be to closely link up the university education to the needs of the engineering company, and bring in the knowledge resource of CREC into the classroom of the foreign students. This helps the students to have knowledge of real cases in each construction link and will narrow the gap between knowledge and application, as well as narrow the psychological distance between students and CREC.

The practical training offered by CREC can be operated in the following two forms:

1) Practical training in different semesters. The students can have a chance to participate in training in CREC to gain first-hand experience of the specific issues involved in the

engineering project. This can help the students evaluate and reconcile what they learn from school with what they are required to do in engineering construction. Meanwhile, the teacher can identify the gaps between class room teaching and real-life engineering practice, and adjust and update the teaching content and plan suited to the realistic construction situation.

2) The other is practice after graduation. Social internship is a general international practice. It is professional knowledge application and consolidation for students while also a good chance for CREC because they can take this opportunity to check the students' actual operational ability and development potential so that they can make a correct decision to hire the students or not in the future. In America, for example, students can apply for a F1 visa for one year Optional Practical Training (OPT) after graduation from school. The application for OPT must be related to the student's major.

Whether the practice is during or after graduation, it will be mutually beneficial for Shijiazhuang Tiedao University(STDU) and CREC. Hence this method is currently widely accepted by most developed countries.

III. SUMMARY OF THE MODE OF CO-TRAINING FOR INTERNATIONAL ENGINEERING STUDENTS

A. Instance Profile

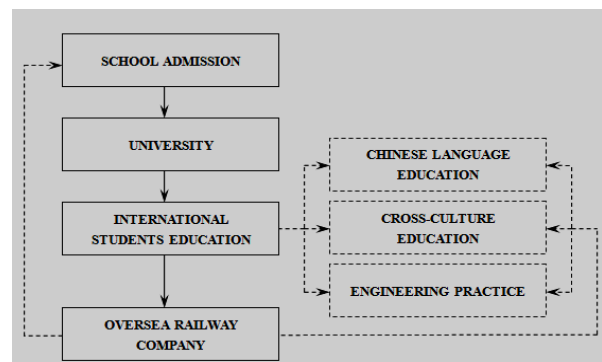


Figure 1. Construction of a co-training mode for CE engineering majors.

A Win-Win Proposal

The co-training mode is a win-win proposition as it brings distinct benefits to both STDU and CREC and creates professional quality, suitability and sustainability in the language translation scenario.

STDU's benefits

1) CREC's intervention serves to cover up for professional qualities lacking in the teachers in the university system.

2) The co-training mode opens up fresh avenues for the teachers to refresh and update their expertise and reduces the gaps between class room teaching and real-life engineering practice.

3) This mode significantly shortens the learning cycle of international student education.

4) The higher employment rate resulting from the improved professional qualities of students of the will bring about enhanced fresh student enrollment in the university’s international student education program.

5) CREC ushers in a fresh atmosphere of real business talk and contract signing.

CREC’s benefits:

1) The involvement in the educational can bring about a new outlook in CREC’s recruitment of translation talents.

2) CREC can assess the potential for hiring the students involved in the program in the future.

3) The standard of professional translation is highly enhanced and the quality is assured.

4) Nurturing translators by themselves is much more beneficial than spending a lot of money in hiring professional translators.

5) CREC’s prospects of future international business is enhanced as the students from different nationalities enter their operational system.

IV. EFFECT ANALYSIS ON THE CO-TRAINING MODE

STDU began to carry out the pilot testing of the co-training mode proposed above in 2011. The 4-year implementation of the new mode improved the students’ passion for studies and the overall performance, as well as positively impacted the employment rate of international students majoring in CE from STDU.

In September 2015, the academic team in STDU made an investigation of the effect of the new educational mode on the Chinese language level and culture cognition as well as the employment rate of the international students. First of all, the first-year international students in 2014 majoring CE were chosen for a sample. The students were divided into two groups named as Group A consisting of non-program students and Group B consisting of program students. Group A had 26 students and Group B had 30 students. All of them were fresh students from CE majors with similar Chinese language proficiency level. The Hanyu Shuiping Kaoshi (HSK), an official Chinese language test system, was chosen as a tool to observe their changes in Chinese language proficiency level. The HSK test includes listening, reading and writing, with full marks of 100 for each aspect and 300 for total. The students pass the HSK test only when their total scores are over 180. All the HSK 4 test results of the sample students covering the three aspects before July 2015 were collected.

Table 1 shows the HSK 4 test result of the first year students before July 2015. It is clear that after one-year Chinese language training, the number of the students who passed HSK 4 in Group B is much bigger than Group A, and scored better marks in each aspect.

TABLE I HSK TEST RESULT OF THE STUDENTS IN 2014

Class	Group A (Number of students)			Group B (Number of students)		
	Listening	Reading	Writing	Listening	Reading	Writing
≥90	3	2	0	10	9	6
80~89	4	2	1	6	8	5
70~79	5	3	3	5	6	9
60~69	3	5	6	6	4	8
≤60	11	14	16	3	3	2
Total ≥180	12			21		

Also, according to the personal interviews done with the students, it was found that the students in Group B had stronger motivation to study, clearer study plan and participated more in extra-curricular activities than the counterparts. They showed a quite strong interest in the Chinese culture, and had more Chinese friends than Group A students.

The students also went through a culture class module as part of their studies enabling them to familiarize and get acquainted with various aspects of Chinese culture. The performance of the students in the culture module was subsequently analyzed. Figure 2 shows the percentage comparison of the HSK 4 test and culture test result between the non-program students and program students. The program students showed a stronger motivation in culture study than the other group. The employment requirements definitely impacted the results of the program students culture test. Figure 3 shows the big difference in employment rate of the international students of STDU as on November 2015. It is seen that the number of the program students who successfully signed employment agreements with Railway Companies was twice the number of non-program students.

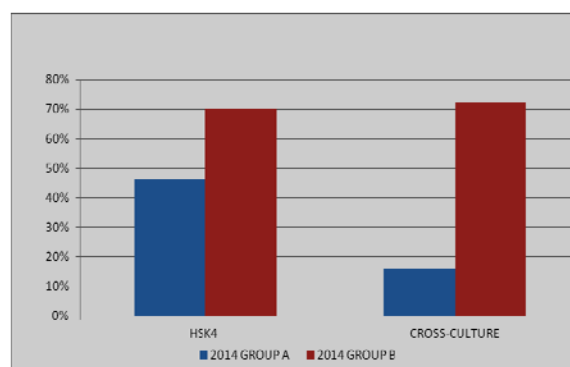


Figure 2: The percentage comparison of the HSK4 and culture test results

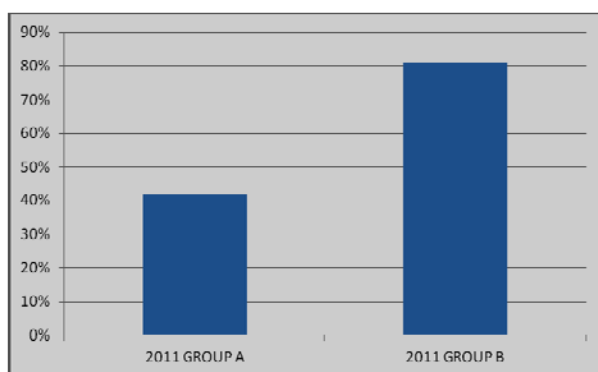


Figure 3 Graduation employment rate in 2015.

As can be seen from the above results, the co-training educational mode proposed in this paper has had significant effect. This method has employed a focused training mode from multiple angles such as teaching syllabus, teaching methods and others. Unlike most of the traditional teaching methods, students not only learn why and how they should improve the language level, but also expand their learning capacity and improve their learning result. Moreover, the new teaching mode shortens the learning time in language education.

V. CONCLUSIONS

Under the context of the Chinese government's promotion of the country's high-speed railway system the development of international construction projects will enter into a milieu of rapid development in the near future. A training mode for high-quality translation personnel will catch more and more people's attention. From the facts stated above, it is easy to conclude that the mode of co-training is a win-win proposition for both CREC and the university. Unmistakably it will be a better choice for CREC to nurture the translator by themselves rather than spend a lot of money to bring in talent from abroad.

In short, the co-training mode proposed between universities and overseas railway engineering companies for international student education is an innovative method in this direction. Undoubtedly, both sides stand to benefit from the cooperation.

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