

Discussion on Professional Course Teaching in Sino-German Cooperation Project

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Abstract. With the Industry 4.0 and Made in China 2025 both explicit the strategic route about how to update modern manufacturing industry. In order to realize the strategic goal, both countries had changed the demand on human resources, especially those who master both Chinese and German language, as well as related technologies of two countries. So, the Sino-German cooperation project was launched to provide such talents, and now after several years some success has been achieved and some flaws have also been exposed in front of educators in the world. This paper will put focus on what opportunities we have, what challenges we face and what possible solutions we can choose.

Keywords: Sino-German Cooperation Project; Language learning; Profession Courses; Domestic Teachers.

1. Introduction

With the internationalized high education and strengthening communication between Chinese and Germany culture, more and more domestic universities have been busy in running Sino-German cooperated education in order to import the cultivation mode in Germany universities of applied science and technology, and high-quality education resource in Germany since 1980s. The original intention was to cultivate inter-disciplinary talent with cross culture capability. They were meant to be proficient at Germany language and applied technology.

According to the official statistics in platform for the Supervision of Sino-foreign Cooperation in Running Schools of the Ministry of Education, up to now, there are 47 domestic universities involved in Sino-German undergraduate and graduate education.

Among them are 8 institutes and 51 projects about Sino-German cooperation running school. Especially, the number is growing dramatically. Sino-foreign, especially Sino-German cooperation in running schools however, is not easy to shape a cutting-edge teaching style or a prevailing pattern.

2. Opportunities

2.1 Combine Advantage School Running Concept

Professional course in mechanical engineering of German applied science and technology universities are composed of serials of modules, which then consists couple of strongly related courses. All courses were set based on the desire and trend of German industry development. It concerns more about the German economy and enterprises practical production. As for the practice session, enough time was given students to facilitate the knowledge they learned at class in factories as much as 20 weeks. It plays a quite important role in enhancing what they have learned and finding out what they should learn after the practice session.

Binary system was proposed in German, which in turn provide German with adequate human resource to make it the most competitive country in manufacturing industry, in the world. It can be simply stated that uniting school and enterprise is an effective way to educate students. Now, the training mode has been spread to more vast area, such as higher education in universities.

Moreover, the Industry 4.0 and Made in China 2025 both explicit the strategic route about how to update modern manufacturing industry. In order to realize the strategic goal, both countries had changed the demand on human resources.

2.2 Make Full Use of the Social Resources of the Two Countries

Robots must become the most important production tools in the future “smart factory”. At present, robots can be used for aerospace, pharmaceutical, mechanical processing, parts production and assembly.

Advanced robots in china are basically monopolized by Europe and Japan, especially for some core technology. The three core technologies of the robot are reducers, servo motors and control systems, which accounts for almost 80% of a robot’s cost. Because the application environment of the robot is complex, uncertain, and even variable, meanwhile, the precise positioning and control of the robot terminal positioning plays an extremely important role in many application scenarios.

The current era of robotics has brought opportunities for the development of applied undergraduate colleges and universities. The talent training model of robotics engineering in china is still in exploratory stage.

3. Existing Problems

3.1 Requirement of Language Learning

Students can study German for only three years after entering the university, during which there are many basic courses to learn, such as advanced mathematics, ideological politics and various professional courses. Three years later, they will be allowed to study forward in a Germany high school. At the interview stage, they must answer questions about details of profession courses, in Germany. It means that three years is all the time they must master a foreign language from zero to daily idioms, and to mechanical engineering related.

Recall our English education. It takes us about 15 years to study English, from a pupil to a junior. After such a long journey, many students can effectively deal with simple communication in daily life, but they still can’t master English ability about majors. Therefore, it is quite a rush time for college students to acquire such a professional German language skill in just three years.

3.2 Interval between Professional Courses of Two Countries

Domestic students have always accepted the test-oriented education from primary school to college. Facing with specific knowledge points, what they first considered is “whether it is a test center or not”. Teachers are accustomed to shouting and knocking the blackboard very seriously to tell the students about every step of a formula derivation and every detail of a point. As a teacher explains to students, what they care is examination and details, and what they ignore is application and macrographs.

Take Sensor and Actuator as an example. Firstly, domestic universities never put sensor technology and actuator technology together. In Germany, it is just one course, however in China it will be divided into three parts including Sensor Technology, Motor Drive and Pneumatic and Hydraulic Transmission.

Secondly, German textbooks are inclined to attach importance on the expansion of knowledge. It covers all aspects of sensor related science, including the circuit connection, signal processing, connection between sensors and the motors, and the like. The type of sensors is quite abundant. However, every introduced knowledge point is so superficial that only basic principle would be described. Without specific calculation steps or application examples, domestic students always feel that there are no explicated important points and they can understand the entire course. But they don’t know how to prepare for the exam or how to start learning, like the way they followed in their past exam preparing history.

3.3 Lacking of Professional German Teachers

As we all know, because German is one of minority language, there are relatively few people who know both Chinese and German, and fewer professionals who understand more about language, but

profession. Although this situation has been alleviated with the increase of cooperation projects between China and German in recent years, it can't satisfy normal demand yet.

Not only should professional German teachers understand the expression of professional words, but also have an understanding of the culture of two country's scientific community. They need have a good grasp of the demand of professional talent, the market development prospect, customs and immigration policies.

3.4 Lacking of English Reserve

Facing the pressure of German study, many students must stop learning English. So, as the university arrange their lessons at every beginning of a semester. This activity has potentially danger. If the student cannot go abroad after three years of domestic study, they can only have one choice to apply for a domestic degree. At this moment, they have passed the best time to take the CET4/6 exam. Without corresponding English certificate will put them in a disadvantageous position to start my career.

4. Possible Solutions

4.1 Establish an Assessment Mechanism for Sino-German Education

The current Sino-German education system requires that a certain number of courses in each semester must be taught by German teachers. Because students can't satisfy the requirements of the professional course, many universities arrange Chinese teacher to give them a corresponding Chinese professional class before the German teachers come to school. The practice has a good original intention, greatly improves the professional of students, and alleviates the dual pressure of language and professional knowledge as German teachers come to school.

Whereas, because Chinese teachers have no right to give students score in the process of implementation s, many students neglect Chinese professional courses. Therefore, it believes that the assessment mechanism of Chinese and German students should be improved from following aspects.

1. Increase the number of courses for Chinese-German teachers to cooperate;
2. Both Chinese and Germany teachers have the responsibility and right to give scores;
3. Fixed time in each semester for German teachers to come China.

4.2 Seeking Auxiliary English Materials

On the one hand, few Chinese professional teachers can speak German, but most of them know English. On the other hand, as an important member of the European Union, German teachers can speak German as well as English. So, we can explore a series of English materials corresponding to German textbooks as a bridge which can narrow the gap between Chinese and Germany. Chinese teachers can use the English material to deepen their understanding of the German course, and use it as a back resource to teach material for students to achieve professional knowledge, while avoiding the embarrassing situation of students giving up English because of learning German.

4.3 Utilize Social Resources under Surveillance

It is not so easy to find a teacher who master both German and professional knowledge in domestic university, but there are a large number of talents from various training institutions in the society who study abroad in German as a student and back home to work part-time or full-time jobs. They are not qualified to be a teacher in university, but they are actually getting both the German and related professions. These talents are not effectively used. The reason can be expressed mainly in two aspects. On the one hand, these returnees do not have a doctorate, so it is difficult to enter the university to become a formal teacher. On the other hand, universities are not allowed to charge students any fees other than tuition and textbook fees under any situation. So, there is still no suitable way for training institution to enter schools. The problem that needs to be broken at present is how to design an effective green channel to introduce social resources into campus.

5. Conclusion

This paper describes present situation of Sino-German profession class education, made clear the opportunities we have in recent years, list some practical challenges and give some useful advice about how to improve the level of bilingual teaching for Sino-German coordinate universities.

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