

# Construction and Realization Path of Professional Internationalization and Practical Teaching System

Zhiguo Wang

Jilin International Studies University, Changchun, China

**Keywords:** Professional Certification; Washington Agreement; International Education; Practical Teaching System

**Abstract:** The implementation of international professional certification has put forward new requirements for the training of high-level talents in engineering and technology specialty. In engineering teaching, practical teaching is particularly important for the cultivation of students' professional ability and engineering ability. In view of the needs and characteristics of training engineering and technical professionals, colleges and universities should construct an internationalized practical teaching system oriented to professional certification, and form a five-in-one, multi-level integrated practical teaching system from in-class experiments to graduation design. Through the application of Sino-foreign cooperative school-running projects, the author's school has promoted the docking of universities at home and abroad, which has proved the rationality and effectiveness of the system.

## 1. Introduction

Under the new situation, many universities in China regard internationalization as one of the objectives of undergraduate talents training, such as Tsinghua University to train “high-level talents with broad international vision facing the world”, Peking University to train “leaders with international vision, leading role in all walks of life and innovative spirit” [1]; Accounting College of Northeast University of Finance and Economics has established “internationalization” as its characteristics. Dalian Institute for Nationalities proposes to train “compound talents who have strong foreign language ability and communication ability and are familiar with international rules, with high quality and application”. There are also words such as “internationalization”, “international vision” or “globalization” in the training objectives of some colleges and universities. It will become an urgent task for colleges and universities in China to cultivate talents with internationalization awareness and knowledge structure, strong communication ability and competitiveness, good knowledge of international rules, ability to adapt to the trend of economic globalization, and ability to cope with opportunities and challenges brought about by the international market calmly [2]. In order to achieve the above goals, universities are required not only to speed up the construction of international teachers, but also to build and implement the international curriculum system as soon as possible, especially the internationalized practical teaching system [3]. The internationalized practical teaching system is an important part of professional education, and it is an effective way to cultivate international applied talents with the combination of theory and practice, innovative consciousness and practical ability.

## 2. Competence Structure of Internationalized Talents

Engineering and technical specialty has the characteristics of strong interdisciplinary, fast technology updating and strong application background [4]. Students trained are mainly engaged in engineering design, engineering construction and management, system integration, information processing and other work, and have certain research and development capabilities. In view of the reform of practical teaching of new subjects, colleges and universities should explore the mode, guiding method and management method of applied undergraduate graduation design which is suitable for the needs of personnel training at the present stage [5]. This will help to improve the

enthusiasm of teachers and students, and promote the improvement of teaching quality and management level. Internationalized talents refer to those professionals with internationalization consciousness and mind, as well as first-class knowledge structure, vision and ability to reach the international level, who are good at grasping opportunities and striving for initiative in the global competition. International talents should have the ability of international activities, modern information technology and innovation [6].

International activity competence, i.e. intercultural communicative competence, is a comprehensive and multi-dimensional concept, which includes not only knowledge dimension, but also thinking dimension, behavioral dimension, emotional dimension and personality dimension. Internationalized talents must master modern information technology and have strong ability to use and process information, that is, to acquire, analyze, process, transmit and apply information. Internationalized talents should not be satisfied with the current situation, and constantly improve methods and means to adapt to changes in the fierce competition in the market [7]. Innovative ability includes self-study and ability to acquire new knowledge, ability to analyze and solve problems independently, ability to independently research and develop knowledge [8]. Internationalized personnel should be able to accurately grasp the logistics, capital flow and information flow of enterprises to form a virtuous circle of cycle-by-cycle and spiral development. They should be familiar with the international market and find the cheapest and most convenient sources of funds, investment direction and risk control technology for enterprises worldwide [9]. They should be able to predict and grasp the environment. Change. The professional abilities of internationalized talents include: good professional ethics, financial management ability, strong written expression ability, organizational coordination ability, decision-making judgment ability and strategic planning ability [10].

### **3. Construction and Realization Path of Professional Internationalization and Practical Teaching System**

#### **3.1. Requirements of professional certification for practical education**

The Washington Agreement is mainly aimed at the international mutual recognition of undergraduate engineering qualifications. For the contracting member countries, the engineering qualifications certified by them are basically the same. In other contracting countries (regions), they can be regarded as having acquired academic qualifications to engage in primary engineering work. The qualifications of the graduates used in this certification are equivalent to the standards in the agreement. In the agreement, the quality of graduates is interpreted as “a combination of independent and evaluative outcomes”. These results are important factors reflecting the potential abilities of graduates, including the ability to acquire some appropriate practical skills. For each signatory country, students who graduate from a certified profession in that country should possess these qualities. These qualities are mainly limited by some scope indicators which are suitable for professional types, covering 12 aspects, and can be divided into three major categories: the first category is engineering and technical ability, mainly including engineering knowledge, design/development solutions, application of modern tools, problem analysis and research; the second category is social ability, mainly including engineering knowledge, design/development solutions, modern tools and research. Including environment and sustainable development, engineers and society, individual and team work, project management and finance; the third category is personal quality, mainly including ethics, communication, lifelong learning. “Engineering Education Certification Standard (2015 Edition)” puts forward specific requirements for students, training objectives, graduation requirements, continuous improvement, curriculum system, teaching staff and support conditions. Among them, graduation requirements are divided into five parts: engineering knowledge, problem analysis, design/development solutions, research and use of modern tools.

### 3.2. Construction of international practice teaching system

To meet the above needs, we should build an internationalized practical teaching system. The development of practical teaching corresponds to students' five levels of ability requirements: understanding and application of Engineering knowledge; design/development solutions; research on complex engineering problems; comprehensive application of professional knowledge to solve complex engineering problems; and service to society. These five levels correspond to different practice modules, as shown in the following figure 1.

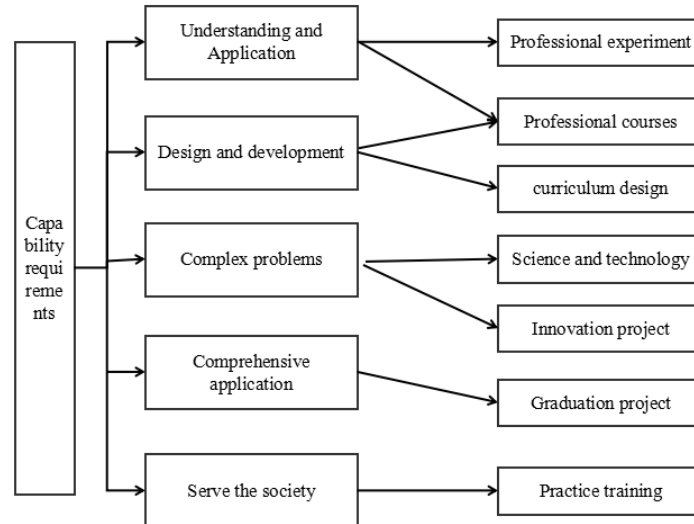


Fig.1. Internationalized practice teaching architecture

Practice module is composed of seven parts: professional experiment, comprehensive design of professional courses, curriculum design, science and technology competition, innovation and entrepreneurship projects and science and technology projects, graduation design, practice and training, covering all the practical learning content of Engineering undergraduates. These seven components correspond to and overlap with the five levels of competence requirements, meeting the requirements of professional certification for graduates' competence.

Understanding and application of Engineering knowledge: mainly through professional experiments and integrated design operations. Professional experiments are not limited to the previous experimental model based on fixed experimental instructions. Open experiments are added. Students are required to design experimental contents and analyze experimental data independently, so as to enhance their ability to analyze problems. For the content that can not be covered by the professional experiment course, we should supplement the design homework to deepen the understanding of the professional theory.

Design/Development Solutions: Mainly through curriculum design and large assignments. By solving specific and targeted engineering problems, students can be trained to solve practical engineering problems. The main source of the subject is practical engineering problems. Combining with the study of theoretical knowledge in class, we should strengthen the understanding of theoretical knowledge and cultivate students' ability of in-depth learning.

Research on complex engineering problems: mainly through subject competitions and student projects. On the basis of solving problems, it emphasizes systematicness and comprehensiveness, and emphasizes the ability of integrating theory with practice. Students are given certain autonomy in the choice of topics. A topic generally covers the contents of many courses. The project is completed in a group, and students' ability to solve complex engineering problems and collaborative spirit are trained.

Comprehensive use of professional knowledge to solve complex engineering problems: mainly through graduation design, is the first three modules of comprehensive use, emphasizing the integration of knowledge and skills. The main source of the subject is practical engineering problems. The training process involves outside tutors to help graduates adapt to the actual work of

enterprises.

Serving the society: mainly through internship and training links to achieve the transition of talent training from school to enterprise, improve the docking between school and enterprise.

Five levels of competence requirements are progressive, from basic theoretical knowledge to becoming a qualified engineer and technician. Therefore, the corresponding practice links are progressive step by step, and each link is organically combined to form a unified whole.

### 3.3. Implementation path

We should adopt a variety of practical classroom teaching methods. For example, modern information technology can be used to carry out multimedia, remote and personalized financial experiment teaching. Students can complete the experiment anytime and anywhere through computer and Internet ports. Teachers can complete the test through video-on-demand, online evaluation and comment. Give full play to the promotion of the second classroom. By regularly hiring practitioners to give lectures or special lectures, visiting enterprises, conducting academic research and participating in various competitions, students' operational and innovative abilities can be improved. To organize students to take part in the international vocational qualification examination and promote the improvement of practical ability. Some colleges and universities can choose appropriate certification examinations according to the teachers and students' conditions, and promote the improvement of students' professional skills through certification.

Establish a “double tutor” system to make up for the shortcomings of teachers and off-campus practice bases. That is to say, we should arrange both in-school and out-of-school tutors for students, and employ professional backbone from enterprises, institutions and government departments with high professional quality, rich professional knowledge, strong working ability and good professional ethics as out-of-school tutors to guide students' off-campus practice. Improve teachers' practical teaching ability. On the one hand, teachers are encouraged to work in enterprises and government departments and take part in management practice activities. Teachers are encouraged to jointly carry out scientific research and declare projects with enterprises and institutions to promote the combination of theory and practice and solve practical problems. On the other hand, teachers are encouraged to take part in the vocational qualification certificate examination, and teachers who have obtained professional qualification are given certain material rewards to promote the improvement of teachers' theoretical level and professional ability.

Optimize the quality evaluation system of practical teaching. Firstly, two-way practical teaching evaluation system should be implemented. Increase students' evaluation of the effect of practical teaching, incorporate the results of students' evaluation of teachers' practical guidance and classroom theory teaching into the assessment of teachers' teaching quality at the end of the school year, change the situation that teachers attach importance to theory teaching and neglect practice, and urge teachers to integrate theory with practice in teaching. Secondly, the content of assessment should be increased. One is to test whether the students have mastered the professional skills of financial management and can withstand the evaluation of the society and the employing units. The other is to increase the qualitative assessment to examine whether the students have developed internationalization consciousness, professional accomplishment and overall viewpoint from the practical teaching.

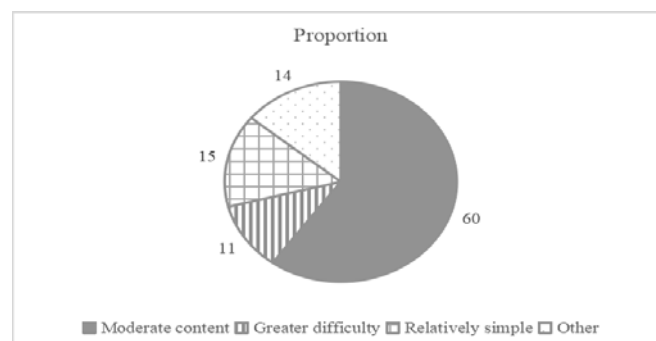


Fig.2. Course satisfaction

By adopting the model of cross-border student and tutor team formation, students can realize the position and role of specialty in the project and cooperate with each other, give full play to the subjective initiative of students in various specialties, expand the scope of students' knowledge, and strengthen the integration and association of relevant curriculum knowledge, so as to improve their learning. The comprehensive quality of students. Figure 2 shows the students' overall satisfaction with the course content. Sixty percent of the students thought the whole content was very moderate, and only 15 percent thought the content was simple.

#### 4. Conclusion

In view of the needs and characteristics of the training of engineering and technical professionals, schools should build an internationalized practical teaching system oriented to professional certification. According to the students' five levels of ability requirements, from in-class experiments to graduation design, a five-in-one, multi-level and integrated practical teaching system is formed. According to the accreditation standard, the school adjusts the specific content of each practical teaching link, improves the teaching mode, and provides a reference for the training system of high-level engineering and technical personnel.

#### References

- [1] Martinez F, Taut S, Schaaf K. Classroom observation for evaluating and improving teaching: An international perspective. *Studies in Educational Evaluation*, 2016 49 15-29.
- [2] Mccrohon M, Nyland B. Academic experiences in teaching Chinese international students. *Journal of Applied Research in Higher Education*, 2016 8 (2) 238-251.
- [3] Kao S, Hwang J, Baek H, Takahashi C, Broselow E. International teaching assistants' production of focus intonation. *Acoustical Society of America Journal*, 2016 139 (4) 2161-2161.
- [4] Ibrahim H, Nair S C. Focus on international research strategy and teaching: the FIRST programme. *Perspectives on Medical Education*, 2014 3 (2) 129-135.
- [5] Amin N F, Saud M S, Kamin Y, Latib A, Azmi N I M. International Teaching Practice in Technical and Vocational Education. *Advanced Science Letters*, 2017 23 (1) 647-650.
- [6] Letitia Del F, Creina M, Julie S. Learning Among Nursing Faculty: Insights from a Participatory Action Research Project About Teaching International Students. *Journal of Nursing Education*, 2015 54 (3) 153.
- [7] Carvalho, Gustavo. Virtual Worlds Can Be Dangerous: Using Ready-Made Computer Simulations for Teaching International Relations. *International Studies Perspectives*, 2014 15 (4) 538-557.
- [8] Gorsuch, Greta. International teaching assistants at universities: A research agenda. *Language Teaching*, 2016 49 (02) 275-290.
- [9] Ashavskaya E. International Teaching Assistants' Experiences in the U.S. Classrooms: Implications for Practice. *Journal of the Scholarship of Teaching & Learning*, 2015 15 (2) 56.
- [10] Zhou J . Managing Anxiety: A Case Study of an International Teaching Assistant's Interaction with American Students. *Journal of International Students*, 2014 4 177-190.