

Research on Talent Training Model and Teaching Reform of Applied Undergraduate Colleges under the Background of "New Engineering"

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Abstract. In the new era, we need high-quality composite "new engineering" talents with strong engineering practice ability, strong innovation ability and international competitiveness. Engineering education should be closely integrated with industrial development. Therefore, under the new situation, we should adopt a variety of ways to strengthen school-enterprise collaboration and cooperative education. It can improve the quality of education, promote employment and entrepreneurship, and improve the quality of human resources.

The development of the new economy poses a challenge to the training of traditional engineering talents. In the future, emerging industries and the new economy are in urgent need of high-quality compound "new engineering" talents with strong engineering practice ability, strong innovation ability and international competitiveness. Market demand requires that they not only have a deep academic study in their majors, but also have the ability to "cross-disciplinary"; and require them not only to use the knowledge they have acquired to solve existing problems, but also to learn new knowledge and new technologies to solve problems in future development. They are not only technically excellent, but also understand economics, society and management, and have good humanistic qualities. It can be said that the new target and demand of the new economy for talents provides an opportunity for the "new engineering", and the development of the new economy calls for "new engineering."

Engineering education is closely related to the development of the industry and supports each other. At present, the supply side of talent cultivation cannot fully adapt to the demand side of the industry in terms of structure, quality and level. Establishing a demand-oriented talent training model and exploring how to link the education chain, the talent chain and the industrial chain are urgent tasks to comprehensively improve the quality of education, promote employment and entrepreneurship, improve the quality of human resources, and promote industrial development under the new situation. We should strengthen the coordination between schools and enterprises, cooperate in educating, and cultivate new talents based on market demand[1].

Although the engineering majors in China have carried out a series of reforms on personnel training and achieved some results, there are still some problems.

The Course Setting is not Reasonable Enough

Most colleges and universities in China have such a situation: students have studied public basic courses and professional basic courses for at least two years in undergraduate studies. The professional class not only has a tight learning time, but also has a lot of learning content. During the learning process, students do not have enough time to digest and absorb the theoretical knowledge of the professional knowledge in the classroom. They lack systematic professional skills training and lack the opportunity to put theoretical knowledge into practice. Therefore, curriculum construction is an important link in the cultivation of applied talents. Establishing a curriculum system focusing on market demand is the primary task of the application-oriented talent training model.

Practice Teaching is Relatively Weak

Practice teaching is an important part of talent training. At present, practice teaching mainly adopts three methods: curriculum experiments in the school, curriculum design and off-campus concentrated internship teaching methods. In this way, the traditional course experiments are mostly demonstration and verification experiments. They are not innovative enough, and there are fewer experimental sessions to develop students' comprehensive application skills. The more serious problem is that some experiments have been separated from the development of new technologies, can not effectively complement the classroom teaching, and can not guide students after the practice of employment. In addition, due to factors such as the normal production of the internship unit and the safety of the students, the internship internships outside the school is not effective. Such as cognitive practice, students are not interested in learning practical skills, it is difficult to achieve the combination of theory and practice.

The Condition of Teaching Staff can not Meet the Need of "New Engineering" Talent Training

In recent years, many colleges and universities have mainly adopted measures such as introduction and cultivation. The scale of the teaching staff has been constantly expanded, and the level of academic qualifications and professional titles of teachers has been improved. In particular, the entry of a number of teachers with doctoral degrees has greatly improved the structure of the teaching staff. Although these teachers have relatively solid professional theoretical knowledge, their practical ability is relatively weak[2]. Their theoretical research ability is strong, but their application and research and development ability is weak, so their teaching tends to put more emphasis on theory than practice. The number of professional teachers with industry background and engineering background is obviously insufficient. The proportion of teachers with enterprise or industry background or engineering background and rich practical experience is very small. There is a serious shortage of teachers who can afford such courses as experiment and practice. This reflects that teachers constitute a single situation, many teachers carry out practical teaching ability and innovation ability in a certain period of time is difficult to meet the needs of enterprises for high-quality applied talents.

In order to solve these problems, we should explore a demand-oriented talent cultivation model. The main measures are as follows:

Teachers Enter the Enterprise, have the Dual-Type Ability.

It is necessary to strengthen the training professional skills of teachers, to organize teachers to go to the relevant enterprises to work using the spare time. Teachers enter the production line of enterprises. They can understand the development trend of enterprises, the job requirements of jobs, and the job adaptability of employment graduates. It can enhance the social responsibility of academic instructors, so that they can better guide the vocational skills of college students. At the same time, they can accumulate experience in production service grassroots work, improve their practical teaching ability, cultivate the quality of "double-skilled dual-energy", promote the transformation and development of schools, and train high-quality professional proficient skilled talents, so as to comprehensively improve the quality of training professional talents[3].

Facing the Post, Rebuilding the Course.

The traditional curriculum construction focus on the teaching materials, ignoring the guiding role of job requirements in talent training. Take civil engineering (construction direction) as an example: After we researched the enterprise, according to the characteristics of the profession, based on the needs of the post, the talents of the construction direction were trained for the actual project, and the post project was run through the curriculum construction. On the basis of the analysis of job workflow and work content, we summarize the typical work tasks of construction posts. We analyze and select the work of the construction workers, and condense the field of action and the corresponding field of study. As a civil construction personnel, the following capabilities should be available: Implementing the relevant national technical guidelines, policies, implementation of various technical specifications, procedures and standards; Ability to read construction drawings;

Application ability to common engineering materials; Ability to conduct construction organization design and construction management; Have a certain knowledge of project cost budget; Ability to conducting construction quality inspection; Ability to handle general structural or structural problems in construction; Have computer application capabilities, Proficiency in office software, Auto CAD software and other related professional software. Therefore, we need to re-set the curriculum system and curriculum structure through the analysis of the construction staff's job tasks.

Set up a four-level professional course –

Professional Foundation Courses: Architectural Drawing and Mapping, Building Architecture, Building Materials, Construction Engineering Measurement, Engineering Mechanics, Building Codes, etc.

Professional core courses: foundation and foundation engineering, masonry engineering construction, concrete engineering construction, roofing engineering construction, steel structure construction, construction organization and management practice, construction technical data management practice, construction safety technology and management, etc.

Professional development courses: construction engineering measurement and pricing, construction engineering accident analysis and processing, bidding and contract management, real estate development and management, construction project management, building electrical foundation ,etc.

Professional practice courses: architectural drawing and CAD training, construction engineering measurement training, engineering measurement and pricing comprehensive training, bidding and contract management comprehensive training, cognitive internship, professional practice, graduation design, post internship.

The Dual Tutor System, Joint Training.

The dual tutor system means that the teaching tasks are jointly undertaken by the school teachers and the enterprise teachers. The professional teachers in the school serve as academic tutors, and the senior technical personnel of the company serve as professional tutors, so that the two can be organically combined. Academic tutors and professional tutors strengthen contact and communication in the process of jointly guiding students. Through the cooperation with professional tutors, academic tutors can obtain typical cases of practical teaching. It also can make up for the inadequacy of teachers' practical experience and enhance their the practical ability. Under the joint guidance of academic tutors and professional tutors, students improve their professional theoretical knowledge while improving their professional practice skills and enhancing their innovative spirit and practical ability. In order to promote close cooperation between schools and enterprises, we should break the constraints of the existing teacher establishment and employment system. We must explore the establishment of teacher mobility or the establishment of part-time teacher positions, and increase the mutual employment of students between schools and enterprises.

Enterprises enter the School, Order Training.

In order to promote the deep integration of enterprises and professions, we should hire enterprise experts to enter the campus as guest teachers to improve the professional training skills of students; We need to introduce enterprise experts to participate in the professional construction of the order class, textbook development, teaching design, curriculum, and internship training in a variety of ways, and to promote the integration of enterprise needs into the talent training. We must improve the pertinence of talent training, tailor our skills application talents. The task-based training model of complementing each other's advantages, sharing resources, and implementing a real production environment for enterprises is truly realized.

Take the civil engineering major of our university as an example: Our university's civil engineering major cooperate with the school's infrastructure department in-depth. During the first and second year of the university, students learn theoretical knowledge and basic skills in accordance with the training programs developed by the company and the profession. In the third year of the university, students directly participate in the school's infrastructure projects, combined with project progress and internships. During this period, teachers and business masters jointly guided and maximized the initiative of the students to equip them with the skills required for a project. In the

fourth year of the university, students can go to the cooperative enterprise to participate in the project internship, and the enterprise will train on demand. At the end of the internship, the company will select the excellent ones to hire combines the results of the evaluation and to achieve a win-win situation between the school and the enterprise combined with the results of the evaluation. In this way, the school and enterprise will achieve a win-win situation[4].

Conclusion

Cultivating high-quality compound "new engineering" talents is the foundation of higher engineering education. The so-called teaching method is indefinite. We should keep pace with the times, demand-oriented, and deepen the cooperation between schools and enterprises. We must constantly update our teaching philosophy and explore the talent training model and curriculum system to cultivate "new engineering" talents with sustainable competitiveness.

References

- [1] Higher Education Division of Ministry of Education, "New Engineering" to build FuDan Consensus[J]. Research in Higher Education of Engineering, 2017(1) :10 -11.
- [2] W.D. Zhou. Probe into the construction of "double-qualified" teachers team in newly-built application-oriented universities[J] Educational exploration, 2013(3):83-84
- [3] B.S. Su. Professional Construction and Teaching Reform of Private Colleges and Universities under the Background of "New Engineering"[J]. Survey of Education, 2017(12):72-74
- [4] Z.H. Reng and X.T. Zeng. Reform and Exploration of the Cultivation of Civil Engineering Professionals in Applied Universities under the Background of "New Engineering"[J]. Western China Quality Education, 2017(9):1-3