The Innovation and Practice of Education Teaching Reform in Major of Petroleum Engineering

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ABSTRACT

The new situation and new requirements of education teaching reform and development in the 21st century, and the establishment of new education certification standards for engineering, have put forward higher requirements for the cultivation of petroleum engineering professionals. Based on the petroleum engineering’s characteristics of a high degree of internationalization and the strong practicality innovation the author of this paper proposed the tutorial system, small classes, individuation, the internationalization develops a new type of petroleum engineering talents training mode, and through the China University of Geosciences(CUG) to the continuous innovation of "the three" reform and practice, the advancement of "One Belt And One Road" internationalization strategy focus on cultivating "virtue, basic solid, professional and sophisticated, the unity of knowing and doing" the high-quality talent, to strengthen moral education and cultivate people as the fundamental task, to share development as the ultimate goal, to adhere to the service demand and local economic and social development as the basic guide, To solve the resource and environment problems faced by the industry to cultivate high-level talents.¹

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THE TUTORIAL SYSTEM IS THE CORE OF TALENT TRAINING MODEL UNDER THE EDUCATIONAL REFORM, FOR THE TUTOR PLAYS AN ESSENTIAL ROLE IN THE DEVELOPMENT OF STUDENTS

In the 1990s, Academician Pengda Zhao proposed that CUG should foster “Talents with 5 Strengths” who possess patriotism as well as a strong sense of responsibility, a strong command of basic theory, rich innovative imagination, solid computer as well as foreign language skills, and strong management capacity [1]. Highlighting students' innovative consciousness and ability training, this idea has become the guiding ideology of talent cultivation for Petroleum engineering major.

The core task of practicing the “333” comprehensive mode of talent cultivation is to implement the “1 system plus 3 actions”. The “1 system” refers to the implementation of tutorial system as soon as students enter university. Aiming to ensure faculty and management support for students, the system is the basic guarantee of educational reform. The “3 actions” refers to the transformation to small-class teaching, individualization, and internationalization in the process of talent training. The connotation of this mode is to take the tutorial system as the core and the small-sized class as the starting point. Thus we can achieve the goal of cultivating individualized and international talents, meeting engineering certification to the maximum extent, providing high-level talents to solve the resource and environment issues faced by this industry.

Life is a one-way process, and everyone needs a mentor in his life. Choosing a good tutor makes one more likely to reach his goals. Accordingly, the tutorial system centers highlights the guidance of the tutor, focusing on the provision of professional tutors for students from their freshmen and sophomore year. Different from the head teacher in high school and the master tutor in graduate school, college tutors act as the mentor and beacon for lower grade students, and are also responsible for senior students' research projects and graduation thesis. They will participate in each link, leading students to amateur science and technology activities, independent innovation sailing projects, academic competitions, production practice, graduation design, etc. until they finish their studies. After graduation, students may choose to find jobs, further their study, or study abroad, and then their tutors will also provide further guidance in this section.

SMALL-CALSS TEACHING IS THE TOOL TO ACHIEVE THE TALENT TRAINING MODEL UNDER THE EDUCATIONAL REFORM

It’s both an innovation of teaching organization mode and a reform of teaching approach. Through the history of teaching development, the teaching mode changed from One-to-One tutoring (like that in the old-style private schooling 1632) to class teaching, and then into large-class teaching (especially after the college enrollment expansion)[2]. Finally it went back to small-class teaching which emphasizes the number of class hours. The "small-class teaching” does not intend to divide one
large class into several small classes, but indicates a teaching pattern with teachers teaching in a large class and students discussing in a small class. Adopted by specialized courses, the system encourages undergraduate students to start the subject study early, enter the laboratory early and join the scientific research team early. The “Large-class teaching” section gives priority to basic theories, grasping the key points and difficulties of the course. In this section, multiple classes of one major are grouped together to listen to the theoretical explanation part of a course. "Small class discussion" section is to divide each class into several groups, in which students will discuss and communicate together and make presentation using PPT. It enables students' personality to be fully respected and developed, and their innovative thinking to be exercised and improved. Practice has proved that the correlation between the grade of small-class students and the class size conforms to the downward trend of glass-smith curve.

INDIVIDUALIZATION IS THE MEANS TO ACHIEVE THE TALENT TRAINING MODEL UNDER THE EDUCATIONAL REFORM

"Individualization" refers to the customized training of undergraduates according to their personal specialties, interests, hobbies and career planning [3]. It is a supplement to the enrollment in large category, the current enrollment method. At present, students take basic courses in their freshman year, regardless of their major. In the next year, students begin to choose or transfer their major freely. It should be noted that each year, only 5% of the students are able to change their majors successfully. And once they have chosen their major, the tutor will work with the head teacher and the counselor to customize a personalized training for each student according to his or her personality. For example, students with good basic knowledge of English and excellent family conditions can choose to study abroad. Students with good academic performance, strong professional interest and experience in scientific research can choose to pursue a postgraduate degree or even a doctoral degree in advance. Students with intermediate GPA and family needs can choose to seek employment after graduation, which indicates that emphasis should be put on their practical ability. Students with strong learning ability and wide interests are advised to learn a double major. What’s more, students with lower GPA and poor psychological quality need more efforts from their tutors to help them maintain physical and mental health and manage to graduate.

INTERNATIONALIZATION IS THE DEVELOPMENT TENDENCY OF THE TALENT TRAINING MODEL UNDER THE EDUCATIONAL REFORM

In countries along the Belt and Road, particularly in Africa and the Middle East, CUG enrolls about 10 undergraduates majoring in Petroleum engineering each year.
Currently, the university has more than 50 overseas students and have already graduated 112. Those students mainly come from Africa, the Middle East and other countries and regions along the Belt and Road. After graduation, they took important positions as international high-end talents in the government, tribes, enterprises, research institutes and other units of their own country. The quality of CUG’s personnel training has been quickly proved, for the graduates have won high praise from employers, which has exerted a far-reaching social impact. CUG has gained a good reputation of cultivating students with wide engineering knowledge, strong practical ability and professional skills. After the study in CUG, their international vision has been gradually expanded while their innovation and entrepreneurship capacity has been gradually improved, and the number of awards in various skill competitions has been increasing year by year. Accordingly, the social popularity and reputation of our school's talent training quality have been improved steadily.

REFERENCES