
The Association and Practice of Excellent Engineering Teaching

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ABSTRACT

The talents training between colleges and enterprises of outstanding engineering is designed to meet needs of the outstanding engineering talents cultivation, to give full play to the advantages of education in colleges and enterprises' practice, to complete it with a seamless docking. In the process of a series of training, it focus on getting well awareness of outstanding engineering consciousness, exploration of multi-level teaching mode, new teaching mode between colleges and enterprises, establishment of engineering certification education system, construction of double-teacher, creation of outstanding engineering' funds and its research on teaching, promotion of the network platform and so on. Through a series of teaching reform, so as to improve the students' initiative, enhance their interest, stimulate their innovative consciousness, for excellence in engineering training teaching new mode and new system laying a good foundation, the further to provide excellent engineering talents cultivation social theory basis and practical experience, at the same time it can also break the secular concept of excellent engineer training constraints.

Keywords: engineering excellence; Excellence mode; Excellence in system; Engineering certification

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INTRODUCE

"Outstanding engineers training plan", as an important task of "The Educational Reform of National medium and long-term program and The outline of developmental planning "which has strategic significance. It's designed to through education and industry, college and enterprise's close cooperation, taking the actual project as the background and taking engineering technology as the principal line to focus on improving the students' engineering consciousness, engineering quality and the ability in engineering practice. It trained a large number of excellent engineers who have great creative ability to adapt to the enterprise's development and the rapid development of economy and society. They can satisfy the requirements of internationalization of science technology and engineering application. There is no doubt that is higher demands and challenges for our country's higher education, especially for higher engineering education. Facing with demands for talents of national economic and social development, as a college with industrial characteristics, that serves for national economic development. It should shoulder responsibility and mission, express the role of its support and lead, cultivate innovative engineering talents to meet demands for development of national economy industry. Laboratories of colleges are important basis for students to learn knowledge and to master skills. The experiment teaching, as one of the important ways to cultivate students' ability, in the aspect of students' practice ability and innovation ability training has an irreplaceable role. As the situation changes, the experiment teaching in the position and role of the engineering technical talents is more and more prominent.

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Our hospital after several excellent engineering operations, according to the enterprise mechanism and technical requirements, etc., if you don't change the original teaching system, it is difficult to maintain the cohesion between colleges. , improve and broaden the basis of the original curriculum system platform, on the basis of implementing people-oriented education idea; In line with strengthening foundation, cultivating the interest and ability, improve quality, personality development, highlight the innovation of the teaching reform goals. Implemented a number of reform measures, and achieved fruitful achievements of teaching reform, has nearly more than 1000 students. Results the main content is as follows:

THE ESTABLISHMENT OF THE ENGINEERING CONSCIOUSNESS

"Excellence initiative" the general idea is: "in the summary of engineering education in our country history achievement and draw lessons from the advanced countries on the basis of successful experience, to the new path of industrialization with Chinese characteristics as an opportunity, guided by the demands of industry enterprises, as the background, with the engineering practice in engineering technology as the main line, through close cooperation in colleges and universities and industries, the talent training standards, reform the personnel training mode, construction of high level engineering education faculty, expand the opening to the outside world, to improve the students' engineering quality, strive to cultivate the students' engineering practice ability, engineering design and engineering innovation ability, construct engineering education mode with Chinese characteristics."

To renew the idea of experiment, to establish the quality objectives, and establish the quality standards of cohesion between colleges. Through the above reform, improving knowledge structure, strengthening the ability to conduct and optimization. Construction of moral, psychological and learning ability, engineering practice, social practice and innovation ability; Knowledge structure optimization, teaching methods and means and reform engineering innovation plan. Also set up engineering innovation environment support platform: including innovation practice base, the construction of the teachers' ability to innovate the cultivation of engineering (including teachers) and three levels quality monitoring and security system. Through education and industry, college and enterprise close cooperation, against the background of practical engineering, engineering technology as the main line, focus on improving the students' engineering consciousness, engineering quality and engineering practice ability, cultivate various types of chemical engineer to adapt to the enterprise development.

After a few excellent engineering talents cultivation, the main DE yong jia textile garments co., LTD, Yorkshire textile auxiliaries, dyeing and finishing of quanzhou new material co., LTD., Guangdong german-american fine chemical co., LTD. And other four companies in the establishment of a joint between colleges cultivate teaching system and engineering teaching platform.

SELECT EXPERIMENT CONTENTS, THE ESTABLISHMENT OF A NEW MULTILEVEL TEACHING PATTERN

In the engineering talents cultivation of engineering excellence, traditional knowledge and modern industry exist contradictions between the process of production, books delinked theory and production. In order to alleviate cognitive deviation, in the original "twelfth five-year" national planning materials, on the basis of a comprehensive cultivation mode of university-enterprise cooperation

Modular

Modular cooperation pattern is refers to the "excellence initiative" enterprise training scheme in a certain education teaching module for college and enterprise cooperation education mode of cooperation. This model is based on the modularization of the content of the cooperation between colleges, which are in accordance with the overall design, specific goals and the principle of gradual, modular design and organization of the whole project of cultivating enterprise education in the teaching content, make each

module has clear target function, and can according to the law of knowledge learning and ability training and interdependence between modules 1 to each module of the implementation of the order, so that each module can be in accordance with the order successively implementation in different enterprises.

Modular cooperation mode can also be considered a goal-driven model of cooperation. This is because, after modular enterprise culture of each module are involved in colleges and universities school develop consistent standards after refining indicators of module, and the implementation of a module, in fact is around to achieve the goal of this module. Such as: (1) the standards and regulations the course completed in guangdong german-american fine chemical co., LTD. Through learning of this course, make the student to the major trading nations production and consumption market conditions, goods entry requirements, textiles, recalls, the technical trade measures have a certain understanding. Of China's major textile exporter to the United States, the European Union and its member states, Japan and other textile related technical regulations, nearly 20 countries non-mandatory government and nongovernmental organizations (ngos) technical requirements and the corresponding detection technology and the key point for a comprehensive understanding of the system. And nearly 100 technical regulations, and test method of terms by learning to master our export textiles, countermeasures against foreign conformity of the technical requirements and are familiar with the technical regulations of testing projects at home and abroad more than 150, standard test method of the basic procedure and key control point and the detection method of different countries. (2) the quality management and quality certification of the course in guangdong german-american fine chemical co., LTD. Quanzhou dyeing with new material co., LTD. Through learning this course, make students understand the theory of product quality control system, systematically master the various printing and dyeing processing process on the quality of the product quality indicators, evaluation methods, analyzed the factors, which affect the quality and the control measures, and master the common fault of printing and dyeing product characteristics, causes, prevention and restoration measures. (3) the course "international trade and practice" guangdong german-american fine chemical co., LTD. With good DE yong textile garment co., LTD. Through learning of this course, students can master the basic concept of international trade practice and theory, familiar with the characteristics of the contemporary international trade, master the import and export business of the whole process of operation, actually dealing with foreign trade business; And through the practice, case analysis and so on a variety of ways of comprehensive practice, trains the student to discover, analyze and solve problems, the basic method and means to strengthen the cultivation of innovation ability, for the students lay a solid foundation for graduate employment.

Modular cooperation mode makes the "excellence initiative" implement training plan of the enterprise can be in different enterprises, which not only reduced the colleges and universities to seek "instead of" the pressure of the enterprise, but also allows the selection of software and hardware conditions are the most suitable for implementing a module of enterprise, to carry out the education teaching task of the module, so as to make the training plan of the whole enterprise modules are able to complete, implemented in software and hardware conditions where enterprises, above a few enterprises are state-owned, private and the private sector, to perfect quality management system in state-owned enterprises, through the flow and transfer of knowledge of students. Although the cultivation of the different levels of excellence engineers need to have accumulated at least a year or so in the enterprise study, however, relative to the different levels of the cultivation of outstanding engineers can use different patterns. Such as: excellence of undergraduate level engineer: social production line demand quantity is big, the level of talent can go to the cooperative enterprise carries on the practice education and field work; Master's level of excellence engineers: a moderate amount of scientific research and technological innovation, adopting double tutorial system between higher vocational colleges. External

enterprise senior engineer - Shi Jie peak (DE) and university professor yi soldiers joint training tutors, specific pattern is: in the university for a year or so of theory study and some experimental skills training, is next to the enterprise to complete the established scientific research and development projects, the use condition of colleges and universities at the same time, the research of the corresponding detection and principle of a return to enterprise's actual production, length of schooling is 3 years.

Projects of Cooperation

Based on the project cooperation pattern is refers to a project as the foundation of college and enterprise cooperation education mode of cooperation. In this mode, between the two sides according to the need of the "excellence initiative" enterprise culture, through the reasonable arrangement and organize students to participate in the actual execution and completion of the project, so that the students can learn in the school theory has been applied in the project practice, cultivate the students' engineering consciousness, training, and improve students' ability to solve practical engineering problems, so as to achieve enterprise cultivation scheme prescribed some standards. Based on the project cooperation mode of project mainly comes from the enterprise's actual engineering project, to solve the enterprise production, design, development, innovation, operation or management activities is important and specific problems, therefore, these projects can be enterprises are implementing or ready to start the project itself, can also is the enterprise development together with the universities and research projects, could also be an enterprise entrusted to complete the project in colleges and universities.

Based on the project cooperation mode the biggest advantage is the ability to form a win-win result on mutual benefit and reciprocity mechanism, can do things eternal hedge-school, men. At present, according to the training goal of undergraduate and graduate students, has signed a four project with three enterprises: one bath dyeing process of polyester/cotton knitted fabric always fine (Deyongjia), resistance to chlorine bleaching fastness to promote the development and study practice the development and application of bleaching agent, cotton clothing, reactive dyeing waste water recycling technology. Through the above construction of the project, teachers and students not only get involved in the whole process of real project experience, and provides the "real thing" the opportunity to solve the problem of engineering practice, reflect the value of knowledge itself; Enterprises to reduce the project research and development of human resources cost at the same time, teachers and students with theoretical advantages, the lack of large practical production experience, with the enterprise research and development personnel to form a complementary advantages, and therefore to a great extent, arouse the enthusiasm of the enterprise cooperation with project counterparts; At the same time pay attention to students' teamwork, communication, organization and coordination ability, make the engineering ability of students not only get sufficient training and promotion, but also make the students' social ability and comprehensive quality cultivation.

Training

After several excellent training of undergraduate and graduate education, the majority of undergraduate and graduate students use of ordering cooperation pattern, solve the shortage of enterprise production in the undergraduate senior technicians, the cultivation of graduate students, strengthen the enterprise research and development team.

Ordering of cooperation mode refers to the colleges and enterprises to meet the needs of enterprise for the future development of engineering talent or enterprise of industry engineering talent market need cooperation education mode. In this mode, the students treated the enterprises "employees", enjoy the benefits of enterprises, universities and enterprises to conduct a more in-depth and systematic cooperation, enterprises out of respect for the enterprise training talents, can take a more open and

positive attitude, students can study in stage of enterprise with advanced equipment, to create a good learning environment, let the student contact advanced engineering technology, but also has outstanding engineers training involved various deep-seated problems closely with colleges and universities to carry out all-round cooperation, achieve the qualitative transformation of students and staff; As a result of employment to basic clear, the students can actively adapt and into the working and living environment of the enterprise, the initiative to understand and familiar with the enterprise management style and operating mechanism and enterprise culture, adopts the approaches of cooperation mode to cultivate outstanding engineers should have very strong market competitiveness.

Field Work

Field work of cooperation mode refers to the university to arrange students to place or work of cooperative enterprises to provide internship cooperation education mode, belong to the low-level cooperation mode. Students can in a relatively fixed production post, experienced engineers in the enterprise and under the guidance of teachers colleges and universities, around the post responsibility system, engaged in production and practice, as well as employees to complete the work specified production tasks, take responsibility and enterprise employees. The main cooperative enterprise is good DE yong textile garments co., LTD, Yorkshire textile auxiliaries, dyeing and finishing of quanzhou new material co., LTD., guangdong german-american fine chemical co., LTD., and other four companies in the production and quality control department.

THE FORMATION OF THE NEW TEACHING SYSTEM BETWEEN COLLEGES

By the changes of teaching model, solved the teaching of the contradiction between the stereotypical and real production, enhance the value of students and college education, thus formed the new between new teaching system.

Carry Out the Education Thought of People-Oriented, Reforming Experiment Teaching Methods

Introduction of "cooperative group learning", "facing the social public opinion experiment" and "to deal with real life experiment" teaching mode. We offer xiangtan TV people care about the "white", "disposable ink" and "white mall invoice" and other excellent video. Through television broadcast media, improve the ego to protect consciousness and the environmental protection consciousness. Using water quality discharge standard (GB/T 5750.8 2006), for environmental control and the integration of knowledge, improve the good DE yong textile garments co., LTD, Yorkshire textile auxiliaries, dyeing and finishing of quanzhou new material co., LTD., guangdong german-american fine chemical co., LTD., and other four companies in dye wastewater treatment technology and water quality monitoring. Students "interest in learning", in "learning experience", in the germination of innovation consciousness "experience".

The Introduction of the Engineering Education Accreditation

Engineering education accreditation only for undergraduate education quality certification system, evaluation system for the cultivation of outstanding engineers.

(1) the engineering personnel training system, improve the quality of engineering education.

Engineering education accreditation emphatically from the core elements in the process of engineering personnel training: training objectives, graduation standards, quality improvement, course system, teachers, support conditions, the application of quasi professional put forward clear standards and basic requirements of colleges and universities to promote and related professional formulates its positioning and social needs of training target, develop graduate with students as the center of the standard, process monitoring, tracking, feedback and continuous improvement of quality standard

mechanism, build support training objectives of curriculum system, meet the needs of the engineering education teachers team construction, guarantee the teaching investment and improve the teaching conditions, so as to establish and improve the professional system of engineering talent, achieve the goal of eventually improve the quality of engineering education.

(2) to strengthen the industry enterprise participation in engineering education, enhance the adaptability of graduate to the industry enterprise.

Industry enterprise expert evaluation and revision should attend the training objective and curriculum system design; Industry or business experts as a part-time teachers; Colleges and universities to cooperate with enterprises to build training and practice base; Industry enterprise technical experts to as certification experts to participate in the engineering education accreditation work.

(3) to promote the internationalization of engineering education, improve the quality of personnel training of international recognition The education development framework was compared with the development of the United States .

Double Platform Development

Set up the "system of archival information, standardization, resource sharing" science laboratory management mode. An experimental project and equipment archives management, implementing human resource and hardware resource sharing and so on.

All Open Campus Teaching Platform

In the platform, the main is to provide students experimental book, preparation and data transmission, etc. In addition to the teacher's lesson plans, video, case, set up the video about the experimental teaching of universities and resource links, such as: Peking University, tsinghua university, wuhan university and harvard, MIT, etc.; Chemical drawing of commonly used software, such as chemoffice, chemdraw, origin, etc. Students can effectively use their experimental data is processed by the computer and find out its deficiencies; Build basic knowledge of the online experiment examination system, effectively build the separation test teaching; The graduate record examination guidelines, help students to understand the various universities on the talent requirements and admissions information, etc.

University-Enterprise Cooperation Platform

"Combination between production and build between higher vocational colleges is to train outstanding engineers should have the advantage of, mainly displays in: can provide real professional environment for teaching, tracking the latest technology in the world, effectively help solve internal training venues, equipment and insufficient resources and have practical experience of teachers and so on many practical problems; Can make a more in-depth and applied undergraduate colleges truly to understand the needs of the enterprise, enhance the initiative of corresponding; To create a better education environment, be helpful for cultivating applied undergraduate course to satisfy the needs of the enterprise and social development of excellence engineers; Can make school professional Settings, training scheme, teaching content and practice closer to the needs of social development, promote the education of the university teaching reform. To promote the construction of teachers, promote the improvement of teachers' practical ability and overall quality. Co-operative can also drive the cooperation between scientific research, etc. In order to better cultivate excellence engineers have the characteristics, following the path of combined with productive labor, society needs talents, synchronize the graduates knowledge, skills, and quality improved. Tries to build up a line with the international advanced level, by international institutions of professional brand, enhance the international competitiveness. According to the requirements of the rapid development of social

economy, the use of information technology, the discipline overlapping, adjust the course content and professional structure, adjust the professional orientation, embodies the advantages of excellent engineers, active adapt to social and economic development of a comprehensive professional structure. With the enterprise, and the close contact of talent market, labor market, comprehensive improve education quality, achieve excellence engineers training mode reform and innovation. Factors: the other is a platform for the experiments, the site has set up a national standard column, enterprise standard, the students can be effectively controlled experiments; University-enterprise cooperation projects and online virtual laboratory is established. Through this platform, the realization of the students, teachers and enterprise three parties exchange and fusion. The students' innovation constantly emerging, such as:

THE ENGINEERING CONSTRUCTION OF DOUBLE

Double Practice

College established a relatively perfect mechanism of enterprise practice. New teacher, must be in a year, learning enterprise management on engineering excellence of professional teacher, must learn in the enterprise each year for half a year. At present, the ratio of professional teachers with double qualifications was 90%, and the external DE yong jia textile garments co., LTD, Yorkshire, textile auxiliaries, dyeing and finishing of quanzhou new material co., LTD., guangdong german-american fine chemical co., LTD. Four companies, such as senior engineer with the CEO of outstanding engineering teacher, accounting for 10% of the faculty. Part-time teachers undertake enterprises the main part of the teaching task, teaching excellence in planning and personnel training plan.

Research Study

A mass of double talent, research-based learning is possible. The implementation of inquiry learning method requires both teachers' cooperation between colleges can effectively. First of all, the problem of inquiry learning, case and the choice of project and compile need teachers' cooperation between colleges and enterprises part-time teachers to master a large number of is the result of engineering practice and case and hosted and participated in various engineering projects, familiar with the education of full-time university teachers teaching law and good at teaching material organization and write, therefore, the teachers' cooperation between colleges can not only meet the requirements of the teaching goal of selected typical engineering problem, case and projects, and organize and write to these materials is good, in order to make students get the best learning effect.

Teachers must be involved in the quality of the engineering project and the quality of the host engineering projects, as an important weight year-end appraisal and title assess, slowly from passive to active, so that continuously improve their business level and teaching ability.

Social Impact

In recent five years, our hospital by national excellent project 2, provincial engineering research excellence teaching reform project of 5, 4 doors, provincial excellent courses at the provincial level key laboratory and provincial key construction projects, the provincial experimental teaching demonstration experiment teaching team construction and municipal quality inspection and environmental testing center, etc. 5 core research teaching reform papers published articles, 10 at the provincial level.

THE ESTABLISHMENT OF INNOVATION FUND BETWEEN COLLEGES

So far, DE yong jia textile garments co., LTD, Yorkshire, textile auxiliaries, dyeing and finishing of quanzhou new material co., LTD., Guangdong german-american fine chemical co., LTD. And other four companies set up in the lower grades in our hospital for "engineering education accreditation fund", "experimental innovation fund". Nearly 150 people received the funding, cooperate with the teacher complete horizontal topic 10 items, including 2 to apply for patents; Over the past five years, the student in collaboration with the teacher, 15 SCI papers published articles, core 10, nearly 30 provincial publications.

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