

Reform and Innovation on Engineering Application-Oriented Talents Training Pattern in Local Engineering Colleges

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Abstract: With the sustainable development of transformation and the continuous emergence of new ideas and measures about Local Engineering Colleges, it creates a new opportunity for research and construction of Engineering Application-Oriented Talents Training Pattern in Local Engineering Colleges. It is an important task to construct a scientific training pattern, we have summarized the characteristics, value orientation, research and practice, which provides reference for understanding the connotation and improving the quality of personnel training.

Introduction

Regarding as a symbol of establishing University (College) Alliance of Applied Technology and holding the first International Forum on integrated developing strategy of industry and Education (2014 spring Forum), the transformation development of local engineering colleges has become a major issue of higher education reform in our society. In particular, 'the Guiding Opinions on the Transformation Development of Local Undergraduate Colleges (Draft)' issued by the Ministry of Education in 2014, which put forward to speed up the construction of modern vocational education system, promote the transformation development of local undergraduate colleges, turn academic colleges into application-oriented ones, and strive to create an integrated ecosystem of production, teaching and research[1], it not only provides guarantee for improving the quality of talents training, but also provides support for promoting economic and social development.

At present, application-oriented talents training has become a research focus in the field of higher education in China. We take "CNKI" as data source, regard "application-oriented talents training model" as the theme, After searching, it is found that there are more than ten thousand documents about it in recent years, it appears increasing trends gradually. It is shown in the table below. (Data statistics time is January 2020)

Table 1. The number of documents on Application-oriented Talents training model

time/year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
number/piece	1893	2258	2701	3150	3648	4427	5359	5417	5717	5235

The Characteristics of Engineering Application-Oriented Talents Training in Local Engineering Colleges

For the local engineering colleges, which bear the important mission of leading the developing direction of local science and technology industry, promoting the development of local regional economy, and providing a large number of senior professionals for the local economic and social development, etc, its talents training are given local applied and innovative characteristics[2], its connotation not only have the common characteristics but also have a unique meanings in cultivating talents.

Adaptability of Talents Training. The application-oriented talents training is to meet the

demands of regional economic and social development, talents diversity and different levels of talents development. The local engineering colleges come from, take root and serve the locality. So talents training should also adapt to, support and satisfy the locality. At the same time, in the process of talents training, it is also necessary to establish personnel training program, curriculum system, major construction, teaching contents and practice links. It is not only the common views to construct the training mode of engineering application-oriented talents, but also the guiding ideas of implementing the application-oriented talents training reform .

Levels of Talents Training. Cultivating engineering application-oriented talents should be at the undergraduate level and adhere to the undergraduate training standards. We should not only master the profound, systematic and theoretical knowledge, but also have the practical abilities related to industries and enterprises, constantly improve the comprehensive quality, guide the practice with theory and verify the theory in practice. At the same time, we should also pay attention to cultivate professional ability, further highlight the practicability, technicality, practicality and integration of talents training, and make "application-oriented training plus professional ability" become talents training orientation in Local Engineering Colleges.

Practicality of Talents Training. Although there are different points about the systematic structure of application-oriented talents training at present, there are many similarities for the practicality of application-oriented talents training. That is to say, regarding practical ability cultivation as the key point and mainline, highlighting the practicality through the two platform modules of theoretical and practical teaching. We should build an effective teaching system, a perfect practical teaching base, a "double-qualified teachers" team with strong practical ability, pay attention to students' ability to solve practical problems, and lay a solid foundation for further improving their professional adaptability.

The Value Orientation of Engineering Application-Oriented Talents Training in Local Engineering Colleges

The engineering application-oriented talents training in local engineering colleges is the embodiment at the level of talents training about the supply-side reform, which is proposed by the state. It is also a strategic deployment and decision-making for adjusting economic structure in our country, it reflects the value orientation of meeting objective needs adapting to economic and social development and construction and inevitable choice about the developing characteristics in local engineering colleges.

The Objective Needs of Adapting to Economic and Social Development and Construction. At present, our country is in a critical period, facing industrial restructuring and economic upgrading, the adjustment and upgrading of economy and industrial structure will inevitably drive economic developing power transformation. In the process, we not only need the theoretical research and guidance, but also need a large number of high-level professionals who master professional and theoretical knowledge, have practical ability and integrate practicality, innovation and ability, it plays an important supporting and driving role in promoting the economic and social development. The engineering application-oriented talents training just focuses on the practicality and ability. So the engineering applied talents training is to adapt to the objective needs of economic and social development and construction.

The Inevitable Choice to Highlight the Developing Characteristics of Local Engineering Colleges. The mission is to be based on the province, serve the region, face the whole country and contribute to the industry, its task is to cultivate the high-level application-oriented talents with strong sense of social responsibility, innovative spirit and practical ability, who have the comprehensive development characteristics of moral, intellectual, physical, aesthetic and labor education. The training process embodies the characteristics of local engineering colleges, that is, they actively adapt to the needs of the industry and local economic and social development, pay attention to optimize the structure and characteristics, provide talents and intellectual support for the national and regional development. So talents training is an inevitable choice to show their own developing characteristics[3],it is also the only way to realize the connotative development.

The Practical Needs of Promoting Individual Development and Relieving Employment Pressure. With entering the stage of higher education popularization, Students' abilities, development and interests tend to be diversified, some are good at thinking and studying, some are good at practice, when we are facing the students who have different specialties, to some extent, the engineering application-oriented talents cultivation has promoted the development of students' personality. Moreover, since the enrollment expansion, more and more students have access to higher education, but what follows is that the severe employment situation and pressure, in the social background, we should adhere to the transformation development, clear target orientation, and focus on the application-oriented talents cultivation, which is the real need to alleviate the employment pressure.

Research and Exploration on Engineering Application-oriented Talents Training Model in Local Engineering Colleges

With transformation reform deepening from local engineering colleges to application-oriented ones, the academic communities have studied and explored the theoretical basis and principle orientation, colleges have also carried out reform and practice on the implementation and operation of the training mode, which is in combination with their own regional, industrial characteristics and developing path, this not only provides guidance for teaching reform, but also lays a solid foundation for continuously improving the quality of talents training.

Change Talents Training Conception - Guided by OBE Conception, Makes it Run Through the Talents Training Process. At present, international engineering education professional certification is carried out quickly and widely, the conception of professional certification has also been popularized and applied in engineering colleges. Especially we integrate the information technology with modern new industrial technology deeply, which is including internet technology, huge data and others, the talents training conception is also undergoing great changes. The ideas of "student centered", "achievement oriented", "continuous improvement" conception are infiltrating into all aspects of talents training, this is just the true portrayal, American pragmatism philosopher, educator and psychologist - DuWei proposed and advocated "education is life", "school is society" and "learning is from doing"[4].

The OBE conception should run through the talents training process, it is required to define the learning effects and expected goal that students will achieve, then according to the expected results and objectives, we reverse to design the teaching process and requirements, and feed the achievements back to the talents training process, so as to improve the quality of talents training with the continuous improving education conception and practice.

Grasp the Key Points of Talents Training - Adjust Knowledge Teaching Structure and Pay Attention to Practical Ability Cultivation. Local engineering colleges regarded cultivating application-oriented talents as their own duties, which are to cultivate high-level talents with all-round development of morality, intelligence, sports, beauty and labor, solid theoretical basis, practical ability and innovative spirit, entrepreneurial awareness, facing the production and management line. So we should adjust knowledge teaching structure in time, when we pay attention to theoretical, basic and propositional knowledge, we should pay more attention to the practical and operational knowledge teaching, so as to meet the needs of application-oriented personnel training.

So teachers and students are communicating and exchanging their knowledge and skills each other, we should also pay attention to the unity of generality and individuality. It should not only reflect the needs of teachers' comprehension, teaching style and other personalized development, but also highlight the demands of students' personalized learning, we create a good atmosphere for talents training and lay the foundation for continuously improving the quality of personnel training.

Reflect the Key of Talents Training - Integrate Curriculum System and Expand Theoretical and Practical Vision. We should take the requirements of knowledge, ability and quality as the main lines, which can satisfy the demands of industrial enterprises for talents training, we also establish graduation requirements, that is substantially equivalent to international engineering education certification, we can make the engineering education reform running through

the whole process of training. Therefore, it requires to integrate curriculum system and optimizes talents training program continuously, combines theoretical curriculum system with practice teaching system closely, needs to consider practical characteristics about course contents, we face career, practical needs, employment market, that is to meet the requirements of development without destroying the subject knowledge system[5], we should pay attention to the unity of theory and practice, expand the theory and practice vision continuously, at last, we can form an excellent theoretical and practical curriculum system that is compatible with regional development, connected with professional contents, reasonable structure system and optimal function.

Curriculum system is talents training carrier, it is also the key to reflect talents training process. So under OBE guidance, we should build a curriculum system that integrates public education, professional education and practical education. We should increase practical teaching proportion, we can establish a completely practical teaching system to meet the needs of engineering practice, realize the transformation from knowledge to ability[6], and then meet the requirements of economic and social development. Moreover, we should integrate the ideological and political elements into the course system, which is embodied in the general and professional teaching practice, so as to achieve the effects of flexible teaching and moistening things silently.

Highlight Talents Training Core - Build up Teaching Staffs and Strengthen "dual ability"teacher training. During the course of talents training, we not only regard students as the talents training core, but also focus on teachers' main position, emphasize the teachers' active development as the main body, respect teachers' personal wishes and choices with profound theoretical knowledge and rich practical experience, including teaching , professional , personal, organizational development [7]. We should establish a two-way flow system about "coming in, going out", adhere to the school-enterprise cooperative project, take an enterprise job training, off-campus practice base, etc. We should employ enterprise experts or engineering technicians as part-time teachers, establish the double tutor system in enterprises and schools, set up practical teaching model based on internship, highlight the practicality of teaching[8]. We should strengthen "dual ability" teacher training, strive to build a high-level teaching staffs which regard the professional teachers as the main part, industry experts and engineers as the secondary ones.

We should adhere to the effective methods such as the combination of school and enterprise training, domestic advanced studies and foreign exchanges , the short-term learning and long-term improvement, we should constantly improve teachers' practical guidance ability, participate in the research and management of engineering projects deeply, realize "zero distance" contact between teachers and enterprises, and effectively guarantee the effects of "dual ability"teacher training.

Establish Talents Training Guarantee—Set up Talents Training Mechanism and Improve Level and Ability of Training. We ensure that the talents training is developing smoothly, improving the quality of training effectively, highlighting the characteristics of training, we should provide talents training guarantee, that is to establish talents training mechanism, especially a new mechanism—school-enterprise cooperation and training engineering application-oriented talents, so as to improve the level and ability of education effectively.

The engineering application-oriented talents cultivation is focused on practical ability. So we should cooperate with enterprises actively, it is necessary to establish the mechanism about school-enterprise consultation, co-management, co-evaluation, co-reform, mutual employment and flow, school-enterprise co-promotion, we will carry out engineering education reform all over the world and further enhance social competitiveness.

Conclusions

We will discuss that the ways to construct engineering application-oriented talents training mode in local engineering colleges scientifically, maybe there are different interpretations and viewpoints from different perspectives,we have studied and discussed the key points from five aspects, it is practical significance to further expand the depth and breadth of the engineering application-oriented talents training in local engineering colleges in new era.

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