

The Research on Vocational and Technical Undergraduate Education Model of Engineering Management Based on Comparative Study*

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ABSTRACT: It is a serious problem to be solved that how to cultivate engineering management vocational and technical undergraduates which fit market demand and the engineering management education of non-key universities is on a very awkward and an important position. This paper draws on the experiences of first-class universities and the national model for higher vocational colleges and constructs a education model of “Horizontal Education, Vertical Development” for the engineering management education of applied undergraduate school.

KEYWORDS: Engineering management; Applied undergraduate education; Comparative study

1 INTRODUCTION

Premier Wen Jiabao pointed out that Our education did not adapt to the requirements of economic and social development and do not meet the national requirements for personnel training in Last year's teacher's Day[1]. Introduction of The national medium and long term program for education reform and development(2010-2020 years) (Public draft) pointed out that our country education unfitted The national economic and social development and requirements of The people received a good education[2]. The heart of two unfits is that talent does not adapt, which an important aspect is applicable talents cultivating is unfit.

2 TRANSVERSE EDUCATION

Occupation and technology is relative concept and has different concept in different times. In the content of the curriculum, it reflect science and theology of relative occupation and technology, engineering and science of relative occupation and technology, occupation and engineering of relative occupation and technology. At present, everyone said training occupation technical talents, which higher vocational colleges and key universities

involved, but different types of schools could cultivate kinds of occupation technical talents. Occupation and Technology Education cultivated talents are different of key universities and higher vocational colleges cultivated talents. Occupation and Technology of Occupation and Technology Education mainly reflected two aspects: one is combined with the academic, technical, occupation; the other is the ability of students adapting society and Occupation skill enhancement[3]. This paper says that transverse Education is education of academic, technical and occupation combination, which draw lessons from teaching experience of engineering management major in Harbin Institute of Technology and Chongqing University and Sichuan builds the occupation Tec college, which improve engineering management major in Occupation technical college.

2.1 Cooperative Education

Cooperative Education was not a new concept, which many institutions study, but Cooperative Education of engineering management will need to be further gone into.

School-enterprise cooperation is that school and business unite as one to build pattern of running school and lay a lot of emphasis on The innovation

* Higher education personnel training quality and teaching reform project from 2013 to 2016: Research on Construction of case teaching model of Engineering Management Specialty (13JGY13)

Project in Science and technology research of Sichuan College of Architecture Technology: Research on teaching practice case of Engineering Management Specialty In Higher Vocational Education (20140208)

of educational system. School-enterprise cooperation brief us on four main points: one is the idea of running update that emphasis was placed on the school as the other as the center and enterprises have been an active participant in the course of running; next is the design of the organizational structure, which establish the link between schools and enterprises and the school organizational structure; Thirdly, that is school-enterprise resource sharing. According to the enterprise needing, School carry out occupation training of employees and expand applied research and technology development with enterprises. Meanwhile, enterprises carry the reform and development of school, school and enterprise jointly formulate the school management and teaching system. Such as, enterprise standard is into teaching and students' internship is being in practice and use in college teaching requires; finally, on the basis of the demand of the enterprises is open operation.

Cooperative education requires students to access to jobs and participate in research for some little time, which could advance their ability of practice. Though the practice of production and scientific research, the students will learn the theory and actual unifies closely and make up for lack of theoretical knowledge. Though contacting production and scientific research, their scientific quality is improved. Though contacting society, they learn to behave, work, train cooperation and team spirit[5].

In the cooperative education, cultivation of application - type graduates through cooperative education of University Of Chongqing and school-enterprise cooperative education of Sichuan builds the occupation Tec college reference to the experience of teaching. Relying on industry enterprises, it builds jointly System construction of five provinces in Southwest China and China Construction Group "91" mechanism though Provinces.

2.2 Do alternates with learn

In the "do alternates with learn", this paper summary the idea "do alternates with learn" on the basis of summarizing the predecessors' research which has been many document for researching such practical methods. Such as, predecessor had researched work-integrated learning, learning by doing, doing by learning, production and research integration and so on.

In the work-integrated learning, it has developed harmonious development of knowledge, ability and quality though several years practical of Shaanxi industrial vocational and technical college, Characterized by Six fusion technology. Its basic meaning is higher vocational college students as main object, professional ability training as the main line, cultural quality and professional quality training

as basis. we must adhere to make talent training and enterprise needs integrate, make professional teachers and skillful craftsman integrate, make theory teaching and skill training integrate, make Teaching content and task integrate, make Ability assessment and the skill appraisal integrate and make Campus culture and enterprise culture integrate for expand utmost students' practical ability and innovation ability and Entrepreneurial ability and professional ability. Then, it realize the intelligence and physique and Occupational Ability of the education comprehensive and harmonious development.

About Professional technical undergraduate education of Engineering Management, the most step is practical training and to foster students' manipulative ability[6]. Therefore, theoretical and practical training are also key, this paper think that this aspect could draw experience from higher vocational colleges and theoretical training must be guaranteed.

3 LONGITUDINAL DEVELOPMENT

Talent cultivation of Professional technical undergraduate education of Engineering Management need longitudinal development of teachers and students personal ability except transverse Education[6]. This paper say that longitudinal development is the construction of teachers team, the teaching contents update according to the market need, deepen education of theoretical knowledge and cultivation of comprehensive quality about students, then it could train high development potential and Innovative professional technical talents of Engineering Management.

3.1 Promote the construction of teachers team

Teacher team is the important pledge to improve the teaching quality and raise the level of school which owes rational construction, Basic solid, excellent morals and academic skills, high academic standards, dynamic and secular stability.for making Professional technical personnel training mode into every major, we must overcome disconnectedness of operation logical, and then we must cultivate teacher team which meet require of Professional technical personnel training that understand teaching and practical.

On the one hand, teachers study and research actively Basic educational theory and enhance the self-knowledge in the light of teaching practical; on the other hand, teachers should go deep among the society and enterprises, and go deep among laboratory and practice base, they should attend to personally, and they should know how to adopt

professional technical personnel and could foster professional technical personnel, they could understand teaching and practical.

3.2 *Updating the teaching contents*

Engineering Management is a new professional in china. Since 1998, the university professional directory has a project management professional; China's construction market is in high speed development period after more than ten years, large construction projects need new technologies and new management methods. Therefore, updating speed of teaching material of engineering management is very fast; teaching content with the demand of the market continues to improve to further international business. Therefore, teachers should take scientific task when they take teaching task, they should make gather experience of Production-study-research cooperation projects into teaching, they should make new technology, new thinking, and scientific research and engineering practice experience and the advanced achievements of scientific research and engineering practical into teaching, and then they teach in the light of themselves research and production practice that optimize teaching content and intensify the link of theory and practice.

3.3 *Theoretical education of wide caliber and heavy-basis*

Vocational and Technical Undergraduate Education of Engineering Management Professional is different from the key universities and the Vocational colleges, which does not emphasis on theoretical knowledge and exercises focus on research methods in education and innovative thinking like the key universities and it does not like the Vocational colleges which are in-depth training in vocational skills and weak aspects of the theory of teaching.

Meanwhile, the professional foundation courses learn when to increase the number of students, student vocational technical colleges, unlike the majority of college students have a strong focus on self-learning ability, therefore, compulsory for professional project management professional courses, schools to attach importance to strengthening education. In order to meet the social needs of the final training of undergraduate engineering management professional technical personnel with appropriate breadth and depth of knowledge.

3.4 *Training featured professional technical professionals*

Engineering Management covers a wide range, not only because there is more than one direction under

a professional, but also because the project management itself has a relatively broad definition. Generally, engineering management is a Engineering from the project, planning, design, implementation, completion and commissioning of the entire process of planning, scheduling and process control in order to achieve the desired objectives collectively work. In fact Engineering is also divided into civil engineering, aerospace engineering, biological engineering, civil engineering is divided into construction, road engineering, bridge engineering, port engineering, project management and therefore become a professional across multiple industries, multiple school background, multi-disciplinary professional guidance[7].

Engineering Management is a multidisciplinary cross-disciplinary, which is required to made wide caliber and it can be seen from the construction of market demand and the rapid development of China's construction management education, the majority of professional project management has established appropriate engineering technology support.

4 MODEL DESCRIPTION

In the whole talent cultivation model of transverse education, vertical development, the transverse education is the foundation and the vertical development associated with progressive layers based on the transverse education.

Meanwhile, based on the transverse education, the teaching ability of university teachers, the improving of the teachers' quality must be as a basis, students' practical ability to exercise, not only requires to be out of school, went into business, while university teachers also have to be higher requirements.

Thus, throughout the model, in order to realize the professional and technical undergraduate education of engineering management, First, it requires in-depth contacts and cooperation between schools and the community to create conditions for real career technical education, and secondly, in order to make the teachers adapt to the Vocational and Technical education personnel it must provide more training opportunities and further education, according to the needs of science and technology innovation and construction markets based on the production - learning - research, it must continuously updated engineering management professional materials.

According to the characteristics of the engineering management, the author advocates wide caliber, heavy-based theory of education, combined with school characteristics and advantages to train personalized engineering management professionals.

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