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Study on the Higher Vocational and Professional Specialty Ability Module of "Construction Management"

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Abstract

The higher vocational and professional specialty of "construction management" of China begun late, and the talent training mode of various colleges are different, especially the analysis to the specialty ability modules on the higher vocational and professional layer is not mature. In this article, combining with the practice of Manjing Institute of Industry Technology, we analyze and study the specialty ability module of "construction management".

Keywords: Construction management, Specialty, Ability, Module

The higher vocational and professional specialty of "construction management" is the trans-subject and strongly practical specialty which can foster the composite super management talents who possess basic knowledge of engineering management, engineering economics and construction technology, grasp the theory, method and measure of modern engineering management science, and can engage project decision and overall process management in the domain of foreign and domestic construction. Combining with ten years' practices of construction and higher educational teaching, aiming at the characters of this specialty, we take the market as the orientation, take the professional technology ability as the core, perfect the theoretical teaching, and establish the specialty ability module cultivation system with the combination of theory and practice.

1. The system design of higher vocational and professional specialty ability module of "construction management"

The "ability standard" is the important character of higher vocational talents, and it generally includes basic abilities such as language and information, specialty ability of various specialties, and development abilities such as human communication and innovation. The cultivation aim of the construction management specialty faces enterprises such as construction enterprise, project supervision enterprise, engineering office, and realty development and management enterprise. Aiming at the graduates' structure demands of knowledge and ability in this specialty, the professional ability of the construction management can be divided into three ability modules including the specialty base ability module, the professional technology ability module, and the integrated application ability module, which progressively compose the ability module system (seen in Figure 1) of the construction management specialty. This ability module system can embody the consistency of necessary skill trainings from vocational posts, make students develop from the base ability to the professional ability and to the integrated ability in proper sequence, and ensure that the practical training is continual and the period proportion is higher.

${\bf 2. \ The \ theoretical \ teaching \ mode \ of \ higher \ vocational \ and \ professional \ specialty \ ability \ module \ of \ "construction \ management"}$

It must take the "ability and quality cultivation" as the core to establish the course platform for the specialty of construction management, and the specialty cultivation aim must be confirmed by the actual demands of modern social construction, and the operation specification must be divided and the knowledge ability structure must be confirmed according to the cultivation aim, and the course teaching system must be established according to the demands of knowledge ability structure. When establishing the course teaching system, we first should cultivate students' qualities and innovational abilities, find the balance between modern scientific technology and traditional teaching contents, persist in the integrated optimization of the course system, and deal with the relationship between the oneness of the

specialty cultivation requirement issued by the country with the diversity of school characters in various colleges, and we also should confirm the status, function and concrete content of every course in the teaching plan, embody the primary and secondary relation, administrative levels relation, interior relation and mutual cooperation among courses, and realize integrated optimization on higher level. Based on above aspects, four course teaching modules are formed.

2.1 The course teaching module of humanistic quality and base

These courses are mainly courses about cultural attainment and human accomplishment, and they are bases for students to study knowledge, implement thinking and basic skill training and cultivate ability. This module can establish base for students to enhance basic qualities and study human courses. The establishment of these courses mainly serves for the cultivation of successive specialty base ability and professional ability, and the establishment must be limited in a few quantities, and be extractive and practical according with the principle of "necessary and enough". These courses mainly include necessary political theory, culture, physical training, and English, computer application base, engineering math and other courses.

2.2 The course teaching module of professional base ability

These courses are the professional basic courses for the specialty of construction management, and they cultivate basic theory and basic knowledge of the technology of construction for students, establish necessary specialty base knowledge to study construction management and construction working procedure and technology. They are necessary basic theory lessons to grasp vocational post skills, and they include management principle, construction cartography, building architecture, construction measurement, construction materials, construction mechanics, earth mechanics, groundsill base and other courses.

2.3 The course teaching module of professional skills

This module is the very important teaching module of this specialty, and the past lesson establishment is unilateral, the teaching materials are refreshed slowly, the contents of the course is relatively lagged, which is disjointed with new knowledge, new standards, new policies and new standards exerted in the construction market, and seriously restrict the cultivation of talent management ability for the specialty of construction management and can not fulfill the requirements of construction market to the talents of construction management. Therefore, when we establish the course platform of construction management, we must timely adjust and update the teaching plan and contents, and take the cultivation of management talents who can "understand design, construction and management" on the production layer as our aim to set up corresponding courses of construction management. These courses are necessary basic skill courses of the vocational posts, and the establishment of the course mainly embodies the vocational requirements and specialty characters, and they include construction economics, construction technology and equipment, construction project management, the introduction of construction supervision, the construction bid and contract management, general construction budget, the introduction of architecture structure and other courses.

2.4 The course teaching module to develop student ability

The establishment of these courses is to embody the relation between the characters of the development direction for this specialty with neighbor subjects, deepen the theoretic base education for the students, train scientific methods and skills and develop students' views and knowledge. On the other hand, it is to enhance students' human quality, fulfill individual interests and favors for students to develop and perfect their individualities. The establishment of these courses tries to develop students' knowledge and vocational directions. These courses mainly include economics, architecture CAD, construction quality inspection and safety, architecture laws, management psychics, realty investment, realty development and management and other courses.

3. The practical teaching mode of higher vocational and professional "construction management" specialty ability module

The post occupation ability of the construction management specialty is composed by many integrated application abilities, and every item of integrated application ability is composed by many professional technical abilities, and every item of professional technical ability is composed by many professional base abilities. Therefore, the specialty of construction management should establish spiral and ascending practical teaching system.

3.1 The progressive practical training mode is adopted to train the specialty basic ability to the specialty technical ability

The specialty base courses are the base of specialty base ability, for example, the architecture cartography and architecture measurement practices are completed on the base of the architecture cartography course and the construction measurement course. The training of professional technology ability is the key to cultivate students' technical application abilities. After students learn the specialty base course and the specialty technical course, they will progressively compile design, budget, bid, contract negotiation, construction aim and other practical training aims into the practical training mission book based on the whole process of construction, then they accomplish the content of

practical training according to the requirements of the practical training mission book. When students finish the studies of "construction cartography", "building architecture", "construction mechanics", "construction structure", they will accomplish the designs of the construction shop drawing and the structure shop drawing, and gradually complete the construction budget, bid document edit, contract negotiation, construction organization and design and various professional technical practical trainings. Through our teaching practices, students generally reflect that they have comprehensive cognitions to the construction proceedings of the whole construction process, and we have got obvious effects to enhance their integrated consciousnesses for the construction project.

3.2 The practical training mode of "project method" is adopted to train the integrated application ability

The teaching practice by means of "project method" is a sort of teaching method that it takes the concrete construction project as the objective to practice teaching for students, and the teacher first decompose the project, drive students' studies by actual tasks, and let students implement following practice, simulation operation, analysis and discussion, and cooperation to complete concrete work tasks surrounding their own projects, and finally evaluate whether students achieve the teaching aim of practice training according to their actual accomplishment situations. This sort of teaching method turns teacher-oriented to student-oriented, and turns book-oriented to "project"-oriented, and turns classroom-oriented to actual experience-oriented. In the process of practice, we take students as the orientation, and teacher is not on the leading status in the teaching practice, and teachers become guides, directors and supervisors in the process that students study, and students' principal characters and innovational spirits have been fully exerted, which makes students effectively achieve the meaning establishment of knowledge what they learn. In the comprehensive practical training of construction management, students play roles such as constructors, quality inspectors and supervisors, and they can obtain comprehensive practice trainings in many aspects such as construction craftwork, construction materials, equipments and employee organization and arrangement, the control of construction schedule and the construction supervision in parts of project such as the base, columniation and girder, wall, floor, door and window and house surface of the construction project.

3.3 The graduate design adopts the practical training mode of "post practice" to train the post vocational ability

In the process of professional technical practice training, former independent centralized practical trainings are progressively linked up from contents according to the construction procedure of the construction project. We arrange students' graduate designs in this specialty in the practical training base and quasi-employment enterprises, and let them work and complete graduate design at the same time by means of "post practice". The contents of "post practice" are instructed by enterprise instructor and college instructor, and students accomplish construction organization design, project budget, bid document, supervision layout, construction technical difficulty analysis and innovation and other actual operation tasks in various domains of construction such as construction enterprise, construction supervision enterprise, cost office, realty development enterprise, and complete their own graduate designs based on that. The institute has first established the network platform of "post practice", and graduate instructor can guide students' graduate designs on this platform. In the concrete implementation, the instructors in and out the institute guide and supervise students' practices together to ensure the quality of "post practice". Because the practical training is implemented under real work environment, so students' post vocational skills are enhanced, and they can quickly adapt the work posts after graduation.

4. Guarantee measures for the theoretical and practical teaching for the specialty ability module

4.1 Updating teaching methods

In the teaching process, we adopt many sorts of teaching methods except for traditional classroom teaching mode, and we more advocate multimedia teaching, construction locale teaching, task drive teaching, case discussion teaching and many modes, and especially for construction locale teaching, we put forward specific requirements. For example, many courses such as "architecture material", "building architecture", "and architecture structure" and "architecture construction" are taught at the construction locale, which can make students more directly and more profoundly study construction materials, construction formations, structure and construction craftworks, achieves the high uniform of learning and practice.

4.2 The establishments of actual training base in and out college

The college practical base of the construction management specialty mainly includes architecture measurement practical training lab, earth mechanics lab, construction cost practical training lab and project management practical training lab, and these labs all equip many software of budget, bid, architecture plot and realty development, and many book materials about architecture standard, criterion, engineering drawing, engineering amount cost table, and all these aspects have formed perfect practical training conditions for the construction management.

The establishment of practical base out the institute mainly depends on construction enterprise, supervisory enterprise, cost consultant enterprise, project management enterprise and realty development enterprise in this industry, which make production, study and research organically combine. In this way, two sorts of study and practical training

environments in the institute and the enterprise are formed, and the reasonable theoretical teaching and practical teaching arrangements make students better grasp knowledge, understand the society, grasp professional skills and comprehensive application abilities.

4.3 Industrial experts participate in the specialty establishment and teaching reform

The institute established the professional guide committee composed by industrial experts and teachers with superior title in the institute, and once professional proseminar is convoked every year, and they will enter into the specialty construction and teaching reform, constitute the talent cultivation plan, teaching plan and outline for the specialty of construction management. The institute also retains experts out the institute as part-time professor of the institute, and these professors will report for teachers and students periodically to make teachers and students timely grasp new knowledge trends of this industry, at the same time, they are also the instructors of "post practice" and graduate design.

4.4 Establishing "Double-Teachers" teacher group

The construction of teacher group is the key problem which is connected with the current and long-term development of the institute, and teachers' knowledge structure, specialty ability and occupational spirit are important conditions to realize the cultivation aim. The higher vocational education takes the cultivation of superior application talents of production, service and management as the main objective, so it requests the institute have a passel of "double-teachers" teachers with higher theoretical level and strong practice abilities. Except for the requirement of education level, the teachers engaging the higher vocational education must possess practical work experiences on production, construction, management and service. 70% of specialty teachers in the specialty of construction management have education levels of graduate student, and they possess titles above engineer and instructor, and have occupational qualifications such as registered construction engineer, registered cost engineer and certified supervisory engineer at the same time. The institute is establishing the national demonstration higher vocational institute, so the establishment of "double-teachers" with higher levels is more important.

5. Conclusions

The research and practice of the basic ability module, the specialty ability module and the integrated ability module for the higher vocational and professional specialty of "construction management" can make for enhancing the teaching quality and the level of teachers in this specialty, more inspire students' study interests in this specialty, and accordingly exert important functions to update traditional teaching concept, teaching measures and methods.

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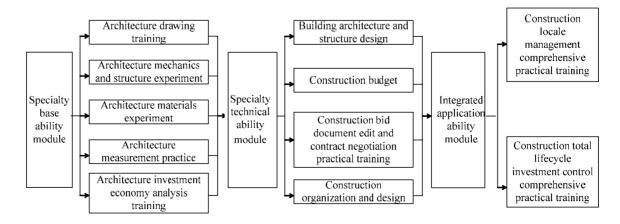


Figure 1. The Ability Module System Structure for the Construction Management Specialty