Exploring the Reform and Innovation of the Course of Engineering Cost Specialty in Higher Vocational Education in China Skills Competition

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Abstract: Higher vocational colleges are responsible for delivering high-quality talents with professional skills for the entire society, and improving the ability of students to adapt to their posts is a key concern of higher vocational colleges. The purpose of this article is to analyze the ability requirements of engineering cost professional positions and organically combine the competition form of the skill competition to cultivate high-quality skilled talents that meet the requirements of engineering cost professional position capabilities. In this paper, an online questionnaire survey is conducted for students who have graduated from the engineering cost major in a vocational college for two years, and scores the importance of the job competence of the newly recruited engineering cost majors. The professional ability requires the top five to be identified as drawing, engineering valuation, engineering quantity calculation (professional software modeling), engineering quantity calculation (non-modeling), and list specification application. Among them, the scores of identification drawing and engineering valuation are 270 and 220, which are much higher than other ability scores. It puts forward proposals for the curriculum reform of engineering cost majors in higher vocational colleges, conducts investigation and analysis, and obtains the information needed for talent training. Based on this, it is necessary to carry out the reform of professional courses and the innovation of talent training models. The curriculum system is based on job competence requirements, and the competition rules of the skill competition are appropriately integrated; the curriculum content is structured in accordance with the logical rules of career growth to reasonably reflect the content of the skill competition; meanwhile, the course teaching should be guided by typical professional activities and create teaching situations, implement a variety of teaching modes, and train high-quality skilled personnel that meet the requirements of engineering cost professional positions.

1. Introduction

The rapid social and economic development has driven the pace of infrastructure construction in China. The construction industry has gradually realized intensive production. The demand for cost management talents is also increasing. In this case, higher vocational colleges have opened a major in engineering cost[1]. During the development process, the engineering cost major has exposed some problems. How to better meet the market demand and cultivate qualified cost management talents is a subject that requires deep research in higher vocational colleges at this stage. Along with the vocational education work adhere to the "service-oriented, employment-oriented" school running policy, vocational colleges and universities vigorously promote the combination of work and learning, school-enterprise cooperation, post-employment internship, and focus on student skills training[2-3]. The skills competition is an important form to test the teaching achievements of higher vocational colleges. As an innovation of vocational education in China, it has become an important standard for education authorities at all levels to evaluate the teaching quality of vocational colleges [4]. "Promote teaching by competition, promote reform by competition", the skills competition has played a clear guiding role in the teaching reform, curriculum setting, teaching mode, construction of training bases, and the construction of dual-teacher teachers in vocational colleges. Positive effects [5]. With the development of the Skills Contest nationwide, the interaction between the Skills Contest and professional development has attracted widespread attention. How to combine the Skills Contest with daily teaching to cultivate "double source" talents
with skills and professional qualities. Students with good job skills, improving students' job adaptability, and delivering high-quality talents with professional skills for the society are the key concerns of higher vocational colleges [6-7]. Vocational college skills competitions highlight the competition of students' practical skills. At the same time, it also provides a diversified platform for schools to demonstrate the quality of professional talent training. To some extent, the skills competition has played an important role in promoting innovative talent training models, changing the course construction thinking, improving the level of teachers, and enhancing communication with enterprises in the industry. However, there are also awkward situations in which the number of students participating is generally small, and the school selects and trains for competitions [8-9]. Therefore, how to make the skills competition a good way to present a virtuous circle of development, so that the results of the skills competition can truly serve vocational education. The curriculum reform and innovation of the engineering cost major based on the vocational skills competition is a new topic facing China's higher vocational colleges [10].

The vocational skills competition is an innovation in China's vocational education reform, and it is also an aid to promote professional teaching development and curriculum reform. In this paper, an online questionnaire survey is conducted for students who have graduated from the engineering cost major in a vocational college for two years, and scores the importance of the job competence of the newly recruited engineering cost majors. The professional ability requires the top five to be identified as drawing, engineering valuation, engineering quantity calculation (professional software modeling), engineering quantity calculation (non-modeling), and list specification application. It is proposed to take the work process of engineering cost-oriented professional posts as a guide and organically combine the competition form of the skill competition to realize reasonable choices of the curriculum content of higher vocational engineering cost-professional majors and cultivate high-quality skilled talents that meet the requirements of engineering cost-specific professional post capabilities.

2. Method

2.1 Curriculum Reform of Engineering Cost

2.1.1 Development status of engineering cost specialty in higher vocational colleges

At this stage, in most vocational colleges, the training of engineering cost professionals is still in the traditional mode, and the curriculum system is set up using a combination of basic courses, professional courses and direction courses. The main problems include the lack of accuracy. Many professional colleges focus on technology or management in teaching, do not realize the organic integration of technology, economy and management, and lack comprehensive development. Second, they ignore market demand. Due to the shortage of cost management talents, major Institutions blindly expand the enrollment scale, ignore the reform of professional courses and the innovation of talent training models, and lack effective docking with market demand, which seriously affects the quality of talent training and the quality of employment. Third, teaching and practice are seriously out of touch. Some higher vocational colleges recognize the problems in teaching and have also actively explored and introduced some effective teaching methods, but due to the lack of practical experience, some higher vocational colleges have emphasized the education of professional skills and ignored the Students' professional ethics and ideological and moral education affect the improvement of students' comprehensive quality and may cause various problems.

2.1.2 Curriculum reform of engineering cost specialty in higher vocational education

The professional teaching of higher vocational education is based on vocational attributes. The vocational attributes of higher vocational education majors should be reflected in teaching. The course teaching goals should be guided by the job capacity requirements of typical professional activities corresponding to this major. The curriculum of education is closely related to the course of action in the professional field [11]. Curriculum, as the most direct means of cultivating students
'ability, seeks to cultivate students' ability to survive and develop, with obvious overall characteristics. Therefore, the course reform process should pay attention to the integrity and local synergy, and cannot unilaterally emphasize some elements. The course reform of the engineering cost major is based on the industry's job capacity requirements. The question to be solved is "What are the course goals?" "What is the course positioning?" "What is the teaching focus?" "What is the implementation path?" Specifically it is the choice of the course content, the order structure of the course content, the course teaching method and the evaluation method.

2.1.3 Capability requirements for professional positions in engineering cost

The job content corresponding to the job group of the engineering cost major is mainly the management of construction projects such as engineering cost management, cost management, bidding and bidding management, and data management [12]. The professional ability of engineering cost practitioners depends on the integration of their professional ability, method ability and social ability. Among them, professional capabilities include graphic drawing, engineering quantity calculation, engineering valuation, engineering settlement, engineering quantity list specification application, bidding management, engineering project financing management, engineering cost management, cost management, contract management, writing, computer applications [13].

2.2 Analysis of the Professional Skills Competition of Higher Vocational Engineering Cost

There are two main types of regular events in the engineering cost professional skills competition at each level.

2.2.1 All competitions are content of professional software applications

The content of the competition is completely a professional software application competition. There are two main events held regularly throughout the country every year. The content of competition 1 is modeling, calculating the amount of civil engineering; modeling, calculating the amount of reinforcing steel engineering; modeling, calculating the installation of hydropower Engineering quantity; construction engineering quantity list valuation; BIM5D construction project cost management and BIM bidding project management, of which construction engineering quantity list valuation and BIM5D construction project cost management each have a weight of 20%, and the remaining items each account for 15%. The assessment content of Event 2 is modeling, calculating the amount of civil engineering; modeling, calculating the amount of reinforcing steel; modeling, calculating the amount of hydropower installation; and calculating the amount of construction engineering. It can be seen that both competitions have assessed the professional software modeling engineering quantity calculation ability and engineering pricing software application ability. One of the competitions incorporates the latest development trends of the industry, and evaluates BIM related management capabilities, the content of the competition and the industry. The content of the job capacity requirements is consistent. However, from the point weight of Event 1, the score of the project pricing competition item is less than the calculation of the quantity competition item.

2.2.2 The competition includes manual calculation and professional software applications.

The content of the event is a competition that combines manual calculation and professional software application content. There are mainly one held regularly every year throughout the country. The competition includes engineering measurement and pricing (manual). The specific content of the competition is construction and decoration engineering, water and electricity installation Engineering measurement and pricing, this item accounts for 50%; In the application of engineering measurement software, the calculation of construction and decoration projects and the calculation of hydropower installation projects account for 40%; based on BIM's engineering cost control, BIM5D applications account for 10%. It can be seen that the event appropriately incorporates the latest development trends of the industry, and assesses the management capabilities related to BIM. The content of the event is consistent with the research content of the industry's job capacity
requirements.
Regarding the score weights of the competition items, combined analysis of the competition items 1 and 2 shows that the score weights calculated by engineering quantities are obviously greater than the project weighted score weights.

3. Experiment
The research object of this article is the students who graduated from the engineering cost major of a higher vocational college within two years. The students who graduated from the engineering cost major of the college conducted an online questionnaire survey through online mailboxes, and then conducted further statistical analysis through recycling. The questionnaire was answered in the form of scoring. A total of 258 questionnaires were distributed and 177 were returned. Among them, 142 were valid questionnaires and the effective rate was 80.23%. The questionnaire mainly scores the degree of importance of the job ability requirements of newcomers to the engineering cost major. The content of the survey is related to the professional needs of the engineering cost professionals, including the ability to identify drawings, project pricing, project settlement, and list specifications. Ability, bidding ability, investment and financing ability, overall process cost ability, cost management ability, contract management ability, visa claim ability, engineering quantity calculation (non-modeling) and engineering quantity calculation (professional software modeling) ability. By scoring the professional competence of newly-employed employees for job requirements, analyzing the requirements of engineering cost professional positions, organically combining the competition form of the skill competition, realizing reasonable selection of the curriculum content of higher vocational engineering cost professionals, and promoting the training of higher vocational engineering cost professionals. The smooth progress of the model has cultivated high-quality skilled personnel who meet the requirements of engineering cost professional positions.

4. Discuss
4.1 Analysis of Survey Results
By conducting a questionnaire survey of students who have graduated from the engineering cost major in higher vocational colleges within two years, the survey results are calculated according to the scoring method. The results of the degree of importance of the job ability requirements of newly-employed employees in the engineering cost major are obtained, as shown in Table 1 and Figure 1.

<table>
<thead>
<tr>
<th>Professional competence</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
<td>Image drawing</td>
<td>270</td>
</tr>
<tr>
<td>Measurement (non-modular)</td>
<td>146</td>
</tr>
<tr>
<td>Metrology (modeling)</td>
<td>165</td>
</tr>
<tr>
<td>Engineering valuation</td>
<td>220</td>
</tr>
<tr>
<td>Project Settlement</td>
<td>38</td>
</tr>
<tr>
<td>Manifest specification</td>
<td>96</td>
</tr>
<tr>
<td>Bidding</td>
<td>4</td>
</tr>
<tr>
<td>Investment financing</td>
<td>8</td>
</tr>
<tr>
<td>Cost of the whole process</td>
<td>48</td>
</tr>
<tr>
<td>Cost management</td>
<td>20</td>
</tr>
<tr>
<td>Contract management</td>
<td>10</td>
</tr>
<tr>
<td>Visa claim</td>
<td>14</td>
</tr>
</tbody>
</table>

Table 1. Importance of job capability requirements for newly hired engineering cost majors
It can be seen that the professional ability requirements of a newly hired engineering costing professional are ranked in the top five, such as map drawing, engineering valuation, engineering quantity calculation (professional software modeling), engineering quantity calculation (non-modeling), list specification application. Among them, the scores of image drawing and engineering valuation are 270 and 220, which are much higher than other ability scores, indicating that these two professional abilities are necessary abilities.

4.2 Suggestions on Curriculum Reform of Engineering Cost Specialty in Higher Vocational Colleges

(1) Do a good job of investigation and analysis

In order to better meet the market demand for engineering cost professionals, higher vocational colleges should do a good job of investigation and analysis, collect and sort out relevant data, and obtain the information needed for talent training. The content of the survey can be divided into several aspects. The first is a survey of the employment situation of previous graduates to understand whether the various knowledge and skills mastered by students in the school can be effectively used in the operation of actual engineering projects. What aspects need to be added? Knowledge, so as to achieve talent training, the second is to investigate engineering construction units and cost enterprises, from the perspective of the market, analyze the real needs of engineering cost professionals and the knowledge and vocational skills required by the post, based on this Reform of professional courses and innovation of talent training model.

(2) Curriculum system is set on the basis of job ability requirements, and the competition rules of the skill competition are appropriately integrated. All aspects of the skill competition are attended and guided by industry enterprise personnel. The content and evaluation criteria of the skill competition reflect the requirements of professional job abilities. At the same time, skills competitions are generally held on an annual basis, and the setting of the competition can keep up with the development of the industry and closer to the actual needs of the industry. Therefore, the curriculum system should be based on the requirements of engineering cost and job capacity, and the competition rules of the skills competition should be appropriately integrated Content, set the curriculum system in line with the principle of work process orientation and make the setting of the curriculum system a certain foresight.

(3) The course content is structured in accordance with the logic of career growth, which reasonably reflects the content of the skill contest. The course content should be universal for students, the ordering of course content should follow the rules of human career growth, the course content corresponding to job abilities should be reasonably ordered, and the focus and difficulties of the course teaching should also reasonably reflect the content of the skills competition. In addition, how to integrate new technologies into the content of the curriculum, each institution should treat...
specific issues differently. The application of some new technologies is incorporated into the content of the event in time, but for the curriculum reform, whether to open a course, add a chapter to the original related curriculum, or just bring it into the teaching process in the form of lectures, local universities should adapt to local conditions. To make a choice, we must not let students understand the development trend of the industry in a blank state, but also avoid the waste of teaching resources. At the same time, course teaching should be guided by typical professional activities, create teaching situations, and implement diverse teaching models. Students learn not for exams, but for doing things and getting things done, and doing things is job professional activities, that is, work processes. Skill competition events reflect typical professional activities, but due to time constraints, it is impossible to reflect the integrity of the work process structure. Curriculum teaching is guided by typical professional activities, organically combined with competition forms of skill competitions, actively creating teaching situations, and implementing diversified teaching modes with students as the main body. Through practical teaching, students can master the elements of the work process and their relationships. In order to obtain a variety of capabilities in line with job requirements.

5. Conclusion

In short, under the new development situation, the engineering cost major of higher vocational colleges has achieved relatively significant results, and also exposed some deficiencies and problems. Managers and relevant teachers should pay attention to it, update their concepts in time, strengthen their understanding, and target professional courses system reform. Guided by the work process of engineering cost professional posts, abandoning the impetuous mentality and utilitarian tendency in the participation of skill contests, realizing reasonable choices of curriculum content for higher vocational engineering cost majors, solving the problem of disordered structure of course content, and highlighting higher vocational engineering cost The characteristics of teaching practice activities that combine professional work with learning, and promote the smooth progress of the training model of engineering cost professionals in higher vocational education, can we cultivate high-quality technical talents that meet the requirements of engineering cost professional positions.

References


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