

On the Construction of Urban and Rural Construction Specialty Group Serving the Construction Industry

—Taking Eastern Liaoning University as An Example

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Abstract—The construction of specialty group plays an important role in the development of applied technology universities. Taking Eastern Liaoning University as an example, this paper analyzes the realistic basis of the construction of urban and rural construction specialty group serving the construction industry, and puts forward the target and specific construction ideas of specialty group construction.

Keywords—construction industry; urban and rural construction; specialty group; construction

I. INTRODUCTION

The so-called specialty group refers to the collection of several specialties or professional directions organized by technical categories, professional posts, etc. The majors covered by the specialty group can be majors of the same occupational technology category, or majors of different occupational technology categories with knowledge and technology connections. The construction of specialty group can realize the educational resources highly shared, and enhance the adaptability and flexibility of specialty construction within the group [1-2]. At present, the applied technology universities have generally recognized the importance and role of the specialty group construction, and regard the specialty group construction as an important strategy to enhance the school-running strength and improve the core competitiveness. According to the composition and development requirements of the regional industries, the applied technology universities should implement the construction and optimization of the specialty group with the goal of the transformation and development of the service industry [3].

II. THE REALISTIC FOUNDATION OF CONSTRUCTING URBAN AND RURAL CONSTRUCTION SPECIALTY GROUP SERVING THE TRANSFORMATION AND DEVELOPMENT OF CONSTRUCTION INDUSTRY

Civil engineering, engineering management, engineering cost, human geography and urban-rural planning are subordinate to the School of Urban Construction in Eastern

Liaoning University. These four majors all serve the construction industry and have the realistic foundations for building the specialty group.

A. From the Perspective of Professional Training Goals

The training objectives of the four majors are all around the urban and rural construction field of the construction industry.

The civil engineering specialty cultivates high-quality applied engineering technical talents who can master the basic principles and knowledge of civil engineering discipline and can be engaged in design, construction, development, management, consultation and other work in the field of construction engineering, road and bridge engineering.

The engineering management specialty cultivates high-quality applied technical talents who can master the basic theories and knowledge of civil engineering, management science and engineering, and can engage in the whole process of engineering management in the fields of survey, design, construction, supervision (project management), investment, cost consultation and real estate of construction projects.

The engineering cost specialty cultivates high-quality applied technical talents who can master the basic theory and basic knowledge of civil engineering, management science and engineering and can engage in engineering decision analysis and economic evaluation, engineering measurement and pricing, engineering cost control, and engineering construction in relevant enterprises and institutions in the field of construction engineering.

The urban and rural planning specialty cultivates high-quality applied technical talents who have the basic theory and knowledge of human geography and urban and rural planning, innovative consciousness and practical ability, and can engage in the front-line work of urban and rural planning and design, surveying and mapping geographic information production and management in small areas.

B. From the Perspective of the Curriculum in the Talent Training Program

There are many cross-disciplinary courses in the four majors. There are more than 10 cross-disciplinary courses in the three majors of civil engineering, engineering management, and engineering cost. The surveying, engineering drawing and map reading, urban planning and CAD drawing of urban and rural planning also have cross-disciplinary courses with the other majors.

C. From the Perspective of Teaching Resources

The practical teaching bases of civil engineering, engineering management, engineering cost, human geography and urban-rural planning are highly shared in the measurement laboratory, drawing laboratory, engineering cost laboratory, engineering management laboratory, building materials laboratory, structure laboratory, soil mechanics laboratory and GIS and remote sensing laboratory.

It can be seen that the above four majors have the basis of building the specialty group from the aspects of talent training objectives, curriculum settings, teaching resources, etc.

III. THE GOAL OF THE SPECIALTY CONSTRUCTION OF URBAN AND RURAL CONSTRUCTION SERVING THE TRANSFORMATION AND DEVELOPMENT OF THE CONSTRUCTION INDUSTRY

A. Strengthen Market Adaptability through the Construction of Specialty Group

The purpose of the construction and implementation of the specialty group serving the industrial development is to solve the problem of the connection between the discipline and the market economy [4]. Therefore, it is necessary to stand at the forefront of the industry to realize the transformation of the concept of specialty group construction. The core difference between the specialty group system and the professional system is that the reasonable specialty group construction is conducive to the adjustment and utilization of educational resources. Such adjustment cannot rely on schools alone. No matter in the research and demonstration, curriculum development and construction, and teaching environment construction, it must be completed with the participation of industries and enterprises. From the perspective of economic development, the construction of specialty group will enable us to maintain the foresight of the construction of specialty group, adapt to the adjustment and development of the economic structure, and realize the concept of professional group construction focusing on breeding [5].

B. Form the Advantages of Practical Teaching and Reduce the Cost of Practical Training through the Construction of Discipline and Specialty Group

To realize the advantages and reduce the cost is one of the purposes of the construction of the specialty group. In the construction of specialty group construction, strengthening school-enterprise cooperation and introducing enterprise resources are also the key and difficult points of the work. With the in-depth cooperation with enterprises, we introduce

enterprise resources, cooperate and develop the practical teaching resources inside and outside the school, develop the practical courses, and introduce the enterprise teachers, so as to achieve the purpose of forming practical teaching advantages and reducing the cost of practical teaching.

C. Form the Advantages of Teachers and Promote the Development of Specialty Group

The advantages of the faculty are not achieved overnight, which requires long-term self-cultivation and cultivation, selective talent introduction, correct training methods and communication at home and abroad, and close cooperation with the industry's front lines. It is not only the difficulty of specialty group construction, but also the key to the success of the construction of specialty group [6].

D. Form Characteristics and Brand Advantages, and Improve the Core Competitiveness

The characteristic is the process, the brand is the goal, the service is the goal. It is very important to form its own characteristics and brand in the process of specialty group construction. Therefore, in the planning of forming characteristic brand advantage, not only the initial target positioned accurately, but also the planning, implementation and completion should be consistent with the goal from the beginning of its construction plan and expansion plan.

IV. THOUGHTS ON THE CONSTRUCTION OF URBAN AND RURAL CONSTRUCTION SPECIALTY GROUP SERVING THE TRANSFORMATION AND DEVELOPMENT OF THE CONSTRUCTION INDUSTRY

A. Curriculum System Construction

Aiming at improving students' practical ability and professional quality, and focusing on the construction of professional core courses combining work and study, the curriculum system of combining work with study is constructed that is compatible with the cultivation goal of high-quality technical and architectural talents.

1) Cooperate schools and enterprises, and curriculum design based on the process of work system.

Curriculum design is based on the professional standards of the housing and construction industry, the employment standards of enterprises and the regional characteristics of the construction industry in Liaoning Province, relied on the analysis of the professional ability of each professional post group, closely focused on the professional training objectives and core skills requirements, and based on the principle of "theories are sufficient for use, strengthening the practical links and highlighting the technical cultivation" to extract typical work tasks, and transform them into teaching tasks.

2) Realize the construction and sharing of platform courses by means of information technology

After integrating professional group resources, using information technology, and designing the content according to the principles of course design, the content will be informatization, open online, co-construction and sharing.

3) *Reform teaching means and teaching methods*

We should vigorously carry out the reform of teaching methods based on project teaching method and various teaching methods, and strengthen the application of integrated theory-virtual-practice teaching, case teaching, on-site teaching and other methods. We should reinforce the comprehensive use of computer teaching software and multimedia teaching courseware, real objects, virtual and simulation and other modern teaching means, and cultivate students' ability of innovative thinking, problem analysis and solution.

4) *Construct teaching materials*

We should establish a mechanism for the evaluation and selection of teaching materials, strictly implement the methods for the selection of teaching materials, give priority to the national and provincial planning teaching materials, and the teaching materials closely combined with post knowledge, to ensure that high-quality teaching materials are selected to use in the class. We should support and encourage teachers to edit or participate in the compilation of school-based textbooks and self compiled textbooks, and pay special attention to the compilation of textbooks matching with first-class courses and practical training guidance textbooks with their own characteristics.

B. *Construction of Practical Teaching Conditions*

1) *Construction of practice base inside school*

The construction of practical training base inside school established in the present practical training conditions focuses on the construction of practical training under the environment of creating real vocational posts, so that students can conduct practical training under the environment of professional posts. The existing drawing laboratory, building materials laboratory, surveying laboratory, geotechnical laboratory, structural laboratory and other practical training places are utilized to provide a good foundation for talents training. We will further improve the construction of related laboratories and transform them into cartographic and BIM laboratories. Through the construction, create a real professional post environment, increase the experiential and staged post training arrangements, and ensure the vocational ability training requirements of students.

We should widely absorb social funds and cooperate with enterprises to build training bases to improve the vocational skills of enterprise employees and lay the foundation for the reform of the talent-training model combining work and study. We should enhance the social service function of the training base, change the consumption training to the regeneration training, set up campus factories, and actively promote the combination of work and learning, school-enterprise cooperation, and resource sharing.

2) *Construction of practice base outside school*

The function of the off-campus training base is to meet students' production practice and post practice. Thus, the following measures will be taken to meet the requirements:

a) *Give full play to the role of school-enterprise cooperation units, establish off-campus practice bases with diverse scales, perfect functions and reasonable distribution,*

to ensure students' post practice, strengthen the talent training function of serving the new urbanization construction of Liaoning Province, and serve all specialties in the form of schools in factory.

b) *The construction of off-campus practical training base focuses on exploring various forms of cooperation modes such as base co-construction, order training, work-study alternations and post practice.*

c) *To meet the development needs of enterprises, establish a firm talent supply-demand relationship with the enterprise, explore the identity of professional teachers and enterprise technicians, and jointly develop training materials and learning packages with the enterprise, so as to explore experience for the further development of the curriculum system that embodies the combination of work and learning.*

C. *Construction of Teaching Team*

By way of introduction, training and hiring, strengthen the training of professional leaders and the construction of backbone teachers' team, reinforce the cultivation of "double-teacher with double abilities" teachers, employ a certain number of technical experts of industrial enterprises, and build a "double-teacher with double abilities" teachers' team which is more reasonable in age structure, educational background structure, and professional title structure, with solid basic theory, strong practical operation ability, high teaching level, noble ethics and a certain scientific research ability that can meet the needs of professional construction and teaching reform, motivate the improvement of the overall practical teaching level of teachers, and provide guarantee for the sustained and rapid development of majors.

1) *Training of professional leaders*

a) *Improve teaching ability:* Learn from the successful experience of specialty construction and teaching reform of other colleges by investigating similar colleges; attend conferences related to teaching construction, curriculum development and laboratory training; and carry out professional construction, teaching reform and other work to improve education concept and professional construction ability.

b) *Enhance the research and development capacity:* Visiting to well-known universities at home and abroad, jointly carrying out scientific research with school-enterprises and expanding international vision to enhance the capacity of scientific technological innovation.

c) *Promote social service capabilities:* Do part-time jobs in enterprises, conduct technical consultation and scientific research and development, and serve the transformation and upgrading of enterprises.

d) *Each professional leader takes the related problems of the professional development direction, curriculum system structure and practice to the enterprise to assume a temporary post for personal training and to seek corresponding solutions.*

2) Training of backbone teachers

a) *Improve teaching ability:* Take part in training related to curriculum development, teaching material construction and experimental training room construction, conduct course construction, teaching material construction, and teaching reform, etc., and improve education and teaching concept and professional construction ability.

b) *Promote social service capabilities:* Do part-time jobs in enterprises, conduct technical consultation and scientific research and development, and serve the transformation and upgrading of enterprises.

c) *Take the related problems of the core courses of the major to the enterprise to assume a temporary post for personal training and to seek solutions that combine theory with practice.*

3) Training of "double teachers with double abilities" Teachers

a) *Improve teaching ability:* Cultivate new teachers by adopting the "assistant teaching system", strengthen the activities of "spreading, helping and leading" in the school to improve young teachers' professional level, encourage teachers to actively participate in various school teaching evaluation activities, and attend domestic teaching and scientific research training or exchange to improve their teaching ability.

b) *Enhance the practical ability:* Assume a temporary post for personal training and practice in the enterprises, obtain the corresponding professional qualification certificate, and attend professional technical exchange training or seminar to improve practical ability.

4) Training of part-time teachers

Actively employ technical experts and first-line skilled workers from industrial enterprises as part-time teachers. By participating in teaching methods and means training, participating in on-site teaching of enterprises and undertaking practical teaching tasks, schools and enterprises jointly cultivate and manage employed personnel to improve their teaching abilities.

D. Innovate the Operating System and Mechanism of Deeply Integrated School-enterprise Cooperation

We will improve the cooperative and open education system led by the government, jointly operated by enterprises, operated by the group and sponsored by the college, and the cooperative education mechanism for co-construction and

sharing of benefits and common growth. We will set up a steering committee for the construction of various specialties in the specialty group, and explore a new mode of school enterprise cooperation. We will promote in-depth cooperation of schools and enterprises with Liaoning Zongyu Group, Dandong Urban Construction and Cultural Tourism Group, explore a new mode of tripartite cooperation in running schools, jointly build a comprehensive training base and a research and development center of engineering technology, comprehensively improve the scientific research level and development ability of schools and enterprises to make it a research base, development base and promotion base of new products and technologies, and promote the transformation and upgrading of the construction industry.

V. CONCLUSION

Through the construction of urban and rural construction majors in the construction industry, we can fully integrate the existing teaching resources of relevant majors, innovate the personnel training mode, strengthen the construction of curriculum system, and innovate the school-enterprise cooperation mechanism, so as to improve the competitiveness of the major and enhance the market adaptability of the major.

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