Discussion on the Cultivation of Architectural Talents in Applied Universities in Digital Transformation

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Abstract: Under the background of digital economy development, digital transformation has become the key direction of transformation and upgrading of traditional architectural design enterprises, which has improved the ability requirements of the society for construction employees. Application-oriented universities, as the cradle of training skilled talents in construction industry, are facing greater challenges. Combined with the characteristics of the industry, this paper discusses the practical dilemma of building talent training in China, and puts forward some appropriate suggestions. Application-oriented colleges and universities should set up course content and teaching mode according to the characteristics of the industry, and cooperate with each other to improve the level of information teaching. In order to enhance the supply of vocational education talents to the industrial demand of the adaptation.

1. Introduction

Under the background that the country vigorously promotes the integration and development of digital economy and real economy and encourages the digital transformation and upgrading of traditional industries, the information technology of construction industry aims to realize the information exchange and sharing among all stages of the whole construction process and participants, and continuously promotes the modernization, intensification and intelligent development of the construction industry.[1] The Ministry of Housing and Urban-Rural Development encourages construction enterprises to deeply study the innovative application of new technologies such as information technology, Internet of Things and artificial intelligence in building information model construction industry, which greatly promotes the information application process of construction enterprises in engineering design, construction and whole process management. The construction industry is one of the foundations of the national economy, which has the characteristics of large-scale industry and numerous affiliated enterprises. There are two advantages of digitalization in the construction industry: First, the construction industry is highly specialized and has a considerable market. In the past two decades, the construction industry has been the basic industry and pillar industry of China's economy. Secondly, the informatization level of the construction industry is backward, which makes the digital transformation of enterprises

play a great role in space.

Therefore, the development of informatization in the construction industry has attracted great attention and continuous investment. The scope and intensity of exchange and training of informatization talents in the industry are constantly increasing, and it is very urgent to thirst for relevant talents imported from colleges and universities. Chinese universities, associations, industry alliances, enterprises and training institutions train professional BIM technical talents in different forms. Compound talents with technology, information and management have become the key goal of cultivating talents in application-oriented universities.

2. Realistic Dilemma of Cultivating Architectural Talents in Higher Vocational Colleges

At present, the informatization development of construction enterprises in China is in its infancy, The development time is short, The degree of application and popularization is not high, There are some problems in the training of information talents in construction industry, such as unclear training objectives, lack of teaching methods and innovative models suitable for high-level applied talents, and lack of effective training for personnel. The shortage of informatization talents in high-level compound construction enterprises has become one of the bottlenecks restricting the popularization and application of informatization in construction enterprises in China.

2.1 Still Adopt the Education and Teaching System That Emphasizes Theory over Practice

Architecture major is a discipline integrating training talents in design, engineering management and production service, which requires students to master theoretical knowledge and have corresponding practical ability. Therefore, the teaching of architecture specialty must pay attention to practical teaching, otherwise it will lead to students' weak ability to adapt to employment after graduation and lack of certain professional quality.

In the curriculum arrangement of higher vocational colleges, practical teaching is in the subordinate position of theoretical teaching, lacking a complete set of practical teaching curriculum system. In practice, due to the particularity of architecture specialty, the requirements for site and equipment are high, and the investment is large, which leads to the imperfection of experimental equipment and teaching base in some higher vocational colleges. In terms of practical content, students can't effectively solve comprehensive engineering problems without promoting cross-disciplinary and interdisciplinary project cooperative practical learning. In the teaching team, some teachers' practical teaching ability is not strong, and practical teaching lacks innovation, which limits the development of students' practical ability.

For students' curriculum arrangement, application-oriented universities are limited by hardware and software. First of all, the school site, equipment and funds are not perfect, which makes students unable to adapt to the advanced market demand in time. Secondly, students can't effectively solve comprehensive engineering problems without promoting interdisciplinary and interdisciplinary project cooperative practical learning. Moreover, some teachers are trapped in heavy theoretical teaching, and their practical teaching ability is not strong, and practical teaching lacks innovation.

2.2 Inaccurate Identification of Talent Demand in Construction Enterprises

At present, many curriculum systems still lack the analysis of professional tasks, practical training courses fail to integrate technology with construction production process, and students lack the cognition of practical work. Professional teaching should be connected with the construction industry structure in time, go deep into the cooperation of enterprises, and realize the adaptation of

vocational skills to the needs of enterprises. For students' informatization ability, in addition to improving students' own skills, teaching software should be updated in time to adapt to the current situation of the industry and break through the dilemma that personnel training is out of touch with the needs of enterprises.[2]

2.3 Unbalance between Supply and Demand of BIM Technical Talents

Most of the BIM technicians in the existing construction enterprises are interdisciplinary training, and there are few talents who solve the urgent needs of enterprises and study systematically. In the process of enterprise digital transformation, construction enterprises are deeply aware of the benefits of applying BIM technology in engineering projects, thus expanding the demand for high-quality BIM technical and technical talents.

3. Basic Characteristics of Information Talents in Construction Enterprises

In the process of construction enterprises transforming to digital informationization, besides the traditional construction technology, the addition of informationization technology is also very important. The collection and coding of construction engineering data and enterprise management data need to be completed by information technicians. At the same time, information personnel need to establish data models and calculation rules according to the technical advantages of enterprises and the characteristics of projects, and use computer software and hardware as tools to carry out data processing of information and data. The results of digital operation calculation will provide basis for enterprise managers' decision-making and project management.

From the business perspective of construction enterprise informationization, this paper analyzes the basic characteristics of talents:

a. In order to promote the informatization of construction enterprises and build the core competitiveness, relevant talents should master the application ability of mature products of informatization software and hardware.

b. In order to successfully realize the "physical construction" and "digital asset construction" of construction enterprises, relevant talents should have the ability of collaborative project management.

c. In order to realize the coordination and unity of organizational culture, operation process and operation mode of data information in construction enterprises, relevant talents should have the ability of multi-organization and efficient operation.

4. Combining BIM Technology to Promote Talent Training Strategies in Application-oriented Universities

To meet the challenge of Architecture 4.0 era, it is the duty of vocational education to train modern architectural professionals, and improving the quality of architectural talents training has become an inevitable choice for higher vocational colleges. In order to help the high-quality development of China's construction industry, the suggestions and countermeasures for the training of architecture 4.0 talents in higher vocational colleges are as follows.

4.1 Integrate Professional Ability with Professional Courses and flexible modular courses

Starting from vocational ability, vocational ability is regarded as the smallest unit of vocational education curriculum content organization, and the process of work tasks is systematically analyzed, which is used as the basis of curriculum setting and content framework organization, so as to

promote the unity of post standards and curriculum standards.[3] On the basis of job standards and ideas, we should establish the talent training objectives oriented to improving students' professional ability and construct the curriculum standards of architecture specialty. Taking the analysis of the real task content of construction jobs as the basis of specialty setting in higher vocational colleges, In the school curriculum, students can acquire work knowledge, work experience and work attitude, improve their comprehensive work ability and professional quality, ensure that students' knowledge structure and technical level meet the needs of the labor market, and find jobs more smoothly after graduation.

4.2 Train Students in Practical Construction Projects under the Whole Process Mode of Construction

The whole process teaching mode of construction project should be implemented in architecture specialty, and the training should be carried out in combination with actual construction project to simulate the real construction site. According to the ability development model, based on situational behavior and empirical learning, project teaching emphasizes that students should carry out in-depth empirical learning and practical exploration in complex situations, so as to improve the intuition and practicality of teaching. By setting up a real working situation, the whole project can be completed by all employees in different roles, so as to improve students' professional ability required to complete the work processes such as analysis, judgment and operation. . For example, BIM involves modeling, building visualization, multi-disciplinary collaborative management and quality management in the whole life cycle of the project, and also includes planning, design, construction, operation and maintenance and other stages[4]. In the whole teaching process of BIM project, all students experience each stage personally and systematically complete tasks, and learn experience from practice, so as to improve BIM application ability, comprehensive knowledge application ability and hands-on operation ability.

4.3 Rational application of digital education resources to improve students' digital skills

The application of technology has promoted the development of educational informationization in application-oriented colleges and universities, and at the same time, the promotion of educational informationization has created new development space for education and teaching. Colleges and universities should make full use of new technology, implement architectural curriculum reform, rationally equip the required digital education resources, integrate technology into education and teaching, and enhance students' digital skills. In the teaching form, BIM technology has great advantages in 3D modeling, which can carry almost all building parameters and provide virtual construction process for teaching. In the teaching environment, teachers can use modern virtual simulation technology to create a suitable learning atmosphere for students, realize the interaction between theoretical teaching and virtual environment, and deepen students' feelings and cognition of building construction [5].

4.4 Deepen the integration of production and education, and promote the coordinated promotion of post-class competition certificates

Deep integration of production and education and dual education between schools and enterprises are important features of strengthening vocational education, and promoting the integration of "post class competition certificate" is one of the effective ways to deepen school-enterprise cooperation. The integration of "post-course competition certificate" requires the connection between architectural professional courses and skill competition and enterprise

certificate system, and the teaching content integrates enterprise industry certification requirements and skill competition ability literacy. Architectural professional courses should be based on the post skill standards of enterprises in the construction industry and meet the needs of the industry, and absorb new knowledge and new processes in the construction industry. In terms of skills training, architecture majors in application-oriented universities should add "1 + X" certificates and skills competition expansion courses, encourage students to actively participate in skills competitions, obtain BIM vocational skill level certificates and other qualification certificates, and improve students' professional skills and expand their employment skills.

Application-oriented universities should adapt to the development of BIM technology and further help enterprises to transform digitally. The promotion of BIM technology and the training of related skilled personnel should pay attention to "adapting to local conditions" and "teaching students in accordance with their aptitude". Application-oriented universities, as the bases for delivering talents to the construction industry, It is an important mission and responsibility of application-oriented universities to closely follow the needs of the construction industry, pay attention to the formation of students' post vocational ability, and help them master construction vocational skills, so as to cultivate compound construction technical and technical talents who can adapt to the changes of the labor market and meet the needs of the information society.

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