

Countermeasures of “Post-Course Competition Certificate” Mode to Promote Innovation and Reform of BIM Course in Vocational Colleges

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Abstract: The model of “post-course competition certificate” can be the basic model of Building Information Modeling (BIM) course teaching in vocational colleges in the new era, and many vocational colleges have also made attempts to construct and apply this model in BIM courses and other professional courses. Based on the application of methods such as literature review and observation, it can be found that it is highly feasible in theory and practice to promote the innovation and reform of BIM curriculum based on this model. However, there are more influencing factors at the practical level, which can easily lead to some problems. In this paper, we will analyze the corresponding problems and put forward a more effective reform strategy of BIM course education innovation in combination with reality.

Keywords: Post-course competition certificate; Vocational colleges and universities; BIM course

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1. Introduction

Compared with the past, the educational innovation environment of vocational college courses is improving, and the cultivation of high-quality applied talents has become the basic goal of education. Under the more mature concepts of industry-teaching fusion and competition for learning, relying on the “post-course competition certificate” mode to promote the innovative reform of Building Information Modeling (BIM) course education has also received more attention, and the positive effects of the “post-course competition certificate” mode have been more recognized. However, we should also recognize that the construction of the corresponding model, and the role of the specific model in the BIM course education innovation and reform are not simple, and many problems need to be resolved in a timely manner. Therefore, it is necessary to explore the countermeasures to promote the educational innovation and reform of BIM course by “post-course competition certificate.”

2. Overview of the “post-course competition certificate” mode to promote educational innovation and reform of BIM courses in vocational colleges and universities

2.1. Connotation of the “post-course competition certificate” model and educational innovation and reform of BIM courses

The model of “post-course competition certificate” is a new model of vocational education, i.e., “employment position + curriculum construction (curriculum teaching) + vocational skills competition + vocational qualification certificate,” which is very much related to the maturity of the concepts of integration of industry and education, and promotion of learning by competitions. At the same time, this model also caters to the trend of vocational education reform and applied talent training in the new era ^[1]. At present, many vocational colleges and universities have carried out the construction and application of the “post-course competition certificate” mode, and the educational connotation of this mode has become richer and richer.

Innovation in BIM course education innovation reform is a specific foundation, but also a specific entry point for reform. Curriculum education innovation usually involves the transformation of curriculum construction and teaching concepts, curriculum system improvement and other content, which indicates that the corresponding curriculum education innovation reform is more systematic and complex, and puts forward some new requirements for vocational colleges and universities as well as the corresponding professional teachers.

2.2. Analysis of the value of “post-course competition certificate” model in promoting the educational innovation and reform of BIM courses

The model of “post-course competition certificate” is of great value in promoting the innovation and reform of BIM course education, which is also a direct reason why many vocational colleges and universities have been practising at this level. From the perspective of curriculum education, the construction and application of the “post-course competition certificate” model can provide assistance for the innovation of the form of curriculum education and the enrichment of the connotation of curriculum education. Generally, the quality of BIM course education can be improved on the basis of the better operation of “post-course competition certificate” mode. From the perspective of training applied talents, the construction and application of “post-course competition certificate” mode can provide assistance for the simultaneous improvement of students’ theoretical knowledge learning ability and professional practical ability. Especially when students’ professional practical ability is improved and they have accumulated a certain amount of experience in vocational skills competitions and obtained a certain number of certificates, their relative advantages in employment can also be improved. However, we should also recognize that it is not simple to promote the educational innovation and reform of BIM courses based on the model of “post-course competition certificate,” and vocational colleges and professional teachers should also think further about this matter.

3. Problems in the “post-course competition certificate” mode to promote the educational innovation and reform of BIM courses in vocational colleges and universities

3.1. BIM course system needs to be further improved

In promoting vocational colleges and universities BIM course education innovation and reform by “post-course competition certificate” mode, whether the BIM course system is perfect will have a direct impact on the course teaching, this impact will also be transmitted to the corresponding mode construction and application, and even the final course education innovation and reform process ^[2]. At present, many vocational colleges

and universities tend to focus on the BIM course teaching form of innovation at this level, and neglect the BIM course system construction causing some of the deficiencies in the course system has not been improved. In the existing curriculum system, the courses related to theoretical knowledge explanation account for a relatively high proportion, practical courses account for a relatively low proportion, and courses related to skills competition and certificate consideration are also very rare. Therefore, the professional curriculum system based on the operation of the “post-course competition certificate” mode is relatively weak, and the innovation of BIM course teaching is also difficult to drive the educational innovation and reform of the curriculum. Due to the lack of a better BIM course system, it is very difficult to build a more scientific and effective “post-course competition certificate” mode, and it is not desirable to teach based on an imperfect course system, which is even more unfavorable to the educational innovation and reform of BIM courses in the new era.

3.2. Unsatisfactory integration of industry and education

One of the guiding ideologies of the “post-course competition certificate” model is the idea of industry-education integration, and the status of industry-education integration will naturally have a great impact on the construction of the “post-course competition certificate” model and the educational innovation and reform of BIM courses based on this model. Based on specific observation, comparison, and analysis, it can be seen that although many vocational colleges and universities have constructed and applied the “post-course competition certificate” model and tried to continuously promote the educational innovation and reform of the corresponding courses, the status of industry-teaching integration is not ideal, which also leads to a relatively slow pace of educational innovation and reform of the courses. Part of the vocational colleges and universities in the BIM professional teaching of the integration of industry and education has poor foundation, and it did not cooperate with off-campus enterprises in professional education and personnel training. When the foundation is weak and lacks experience, students lack job practice opportunities, and it is difficult to effectively cultivate the practical ability of BIM system. Plus, professional teaching is completely confined to the school and classroom, students face difficulties in familiarizing themselves with the workflow of professional-related positions, which, to a certain extent, weakened the employment advantage of students. Even if we can construct the model of “post-course competition certificate” and carry out educational innovation reform, the effect of educational innovation reform is often poor.

3.3. Relatively low effectiveness of skills competitions

In the “post-course competition certificate” mode, “competition” is a very important professional education and talent cultivation pathway, the competition to promote learning has many advantages. However, many vocational colleges and universities have not done well in the construction and application of the “post-course competition certificate” mode of planning to promote learning, and the effectiveness of vocational skills competitions is relatively low, which is also a problem in the construction of the corresponding mode, as well as the corresponding curriculum and educational innovation and reform. Students in vocational colleges and universities have relatively limited opportunities to participate in off-campus practice, especially for many newly enrolled students, whose understanding of BIM knowledge is relatively poor, and lack of systematic understanding of engineering management, the educational advantages of various vocational skills competitions are apparent. On the contrary, most of the vocational colleges do not regard the design, organization, and implementation of vocational skills competitions related to BIM courses as the basic matters in education. In addition to the small number of BIM operation-related skills competitions, the quality of some skills competitions is relatively low, and it is more difficult to achieve the goal of promoting learning

through competition. In the long run, there will be a disconnect between students' BIM knowledge learning and knowledge application, and the deeper education and innovation reform of BIM courses will be affected.

3.4. Evaluation of talent training has certain limitations

In promoting the innovation and reform of BIM course education, the “post-course competition certificate” model will inevitably involve the cultivation and evaluation of talents, especially after the BIM course education form has changed significantly and the educational content has become more and more abundant, the cultivation and evaluation of talents should be effectively adjusted. However, many vocational colleges and universities did not do well in the “post-course competition certificate” mode of BIM course education innovation and reform of talent training evaluation, the corresponding evaluation mechanism also has a lot of unsound aspects. From the perspective of the main body of talent training evaluation, school teachers are still the most basic professional course education evaluation and talent training evaluation of the main body, although the “post-course competition certificate” mode of professional education and talent training subject increased significantly, but the main body of talent training evaluation is still solidified. As a result of not building a complete talent training evaluation mechanism, talent training evaluation of the main body and the form is relatively single, which is not conducive to the school's better grasp of the “post-course competition certificate” model construction and application of the situation, but also lead to BIM course education innovation and reform with a great deal of blindness, and a lot of educational problems and talent training problems will easily arise.

4. Specific countermeasures of “post-course competition certificate” mode to promote BIM course education innovation and reform in vocational colleges

4.1. Continuously improving the BIM course system

It is preferable to take the “post-course competition certificate” model as the driving force for the educational innovation and reform of BIM courses in vocational colleges and universities, but vocational colleges and universities should continue to improve the BIM course system. Especially when it comes to the integration of industry and education, competition for learning and some certificates, the BIM course system should be adjusted ^[3]. For example, a higher vocational college has optimized the BIM curriculum system based on the model of “post-course competition certificate” in 2022. This higher vocational college has developed a school-based curriculum for BIM majors in combination with the needs of industry-teaching integration, and the specific school-based curriculum has more practical teaching content. At the same time, the higher vocational college also adjusted the BIM curriculum system with the development of skill competition and the students' skill certificate. After improving and optimizing the BIM curriculum system, the operation of the “post-course competition certificate” mode has received more support, and the support of the perfect BIM curriculum system can also assist in the reform of the corresponding curriculum education innovation ^[4]. Therefore, other vocational colleges and universities based on the “post-course competition certificate” mode to promote the BIM course education innovation and reform should also be based on the improvement of the professional curriculum system, in order to provide more help for students to better adapt to the new education model.

4.2. Vigorously promoting the teaching of industry-teaching integration courses

In the construction and operation of “post-course competition certificate” mode, industry-teaching integration course teaching is a very effective teaching method. In particular, in order to better promote the innovation and reform of BIM course education, industry-teaching integration teaching should also become the most

basic form of BIM course education ^[5]. For example, in the teaching of BIM system operation related courses, vocational colleges and universities should be combined with such practical courses, in order to better link professional classroom teaching and practical teaching in off-campus training bases together. On the basis of close communication between professional teachers and the person in charge of off-campus practical training, the theoretical knowledge related to BIM system operation can be explained in a better way to maintain consistency with practical teaching. For vocational colleges and universities, they should combine the actual needs of the construction and application of the “post-course competition certificate” model, actively cooperate with relevant enterprises outside the school, build stable school-enterprise cooperative relationships, and provide students with more diverse BIM professional practice options. After the industry-teaching integration course teaching gradually becomes a basic form of teaching, the connection between “post” and “course” in the education innovation reform of professional courses will be increasingly close, which naturally helps to accelerate the pace of education innovation reform of the corresponding courses ^[6].

4.3. Enhancing the effectiveness of skills competitions from multiple perspectives

Whether the skills competition can be carried out well will affect the construction and application of the “post-course competition certificate” model. In order to better promote the innovation and reform of BIM course education based on this model, vocational colleges and universities should pay more attention to the organization and development of the skills competition in the BIM course education, so as to achieve the goal of promoting learning through competition ^[7]. Specifically, vocational colleges and universities can take the skills competition as the basic BIM professional teaching form, so that the skills competition is a more practical teaching activity that can better promote the improvement of students’ practical ability. In addition, vocational colleges and universities can fully consider the feedback from off-campus training bases in the school-enterprise cooperative teaching, and create skill competitions with different themes and focuses, combining the skill deficiencies in students’ off-campus training and the demand for BIM-related skills in the jobs, so as to cultivate students’ BIM-related professional skills ^[8]. Along with the regularization of vocational skills competitions and the continuous improvement of the effectiveness of vocational skills competitions, the “teaching” of teachers, the “learning” of students and the “promoting learning” of skills competitions can be better combined, which naturally can better promote the corresponding curriculum education innovation and reform.

4.4. Constructing a whole-process talent training mechanism

In order to avoid the reform of BIM education innovation based on the model of “post-course competition certificate” from becoming a mere formality, vocational colleges and universities should optimize the talent cultivation mechanism by combining the changes in professional teaching and talent cultivation ^[9]. It is recommended that vocational colleges and universities build a whole-process talent cultivation mechanism, and conduct corresponding evaluations in multiple ways and dimensions. From the diversification of the main body of talent training evaluation, vocational colleges, teachers, students, off-campus training bases should become the main body of talent training evaluation. After the evaluation subject is diversified, the talent training evaluation can naturally be carried out simultaneously from different angles. From the perspective of clarification and refinement of talent training standards, vocational colleges and universities should take the performance of students’ curriculum education and teaching, job performance, performance in skill competitions, and performance in certificate examinations as specific evaluation standards. At the same time, vocational colleges and universities should also maintain communication with off-campus training bases at the level of talent cultivation evaluation, so as to better grasp the professional teaching and talent cultivation status,

and a better grasp of this information can also avoid the application of the “post-course competition certificate” model, as well as the BIM curriculum education innovation and reform with a high degree of blindness^[10].

5. Conclusion

Vocational colleges and universities should deepen their understanding of the construction and application of the “post-course competition certificate” model, pay more attention to the educational innovation and reform of BIM courses in the new era, and take the “post-course competition certificate” model as an important force to promote the educational innovation and reform of the corresponding courses. Considering that the construction and operation of this specific mode is very difficult, and based on which some problems are likely to occur in promoting the educational innovation and reform of the corresponding courses, vocational colleges and universities should also perform systematic evaluation well, and continue to optimize the “post-course competition certificate” mode, and carry out more in-depth adjustments to ensure that the construction of the corresponding mode will be carried out in a more in-depth manner in the teaching of the BIM course and the cultivation of applied talents. Thus, it ensures that the construction and operation of the corresponding mode of value can be better played out.

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