



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 1, January 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

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Exploration of Applied Talents Training Mode Based on BIM Technology

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ABSTRACT: BIM technology as an emerging technology in the construction industry has been widely used in practical engineering. The whole engineering field is in urgent need of BIM talents, and major universities have also successively opened BIM-related courses. By analyzing the problems faced in the process of BIM talent training in civil engineering, this paper discusses the specific measures to cultivate BIM talents from the aspects of talent training objectives, teacher team construction, professional curriculum system, curriculum teaching resources, annual teacher assessment and so on, in order to cultivate high-quality innovative BIM talents with excellent professional ability and employment ability.

KEYWORDS: BIM, Civil engineering, Talent training, Practical ability.

I. INTRODUCTION

With the continuous development of information technology, BIM (Building Information Modeling) technology is becoming more and more mature, which plays a huge role in reducing costs, improving efficiency, improving quality, promoting innovation. The national government has introduced a series of policy measures to vigorously promote BIM technology and popularize it in the construction industry. However, the existing BIM talents cannot meet the needs of the development of the construction industry. In order to solve the problem of BIM talent shortage and make civil engineering students more competitive in employment, it should comply with the development needs of the times, promote the deep integration of industry and education, promote school-enterprise collaborative education, and strive to cultivate BIM talents in civil engineering [1]. Analysis, practice, creativity and communication ability are the new requirements for engineering and scientific talents. At present, there are phenomena such as the theory divorced from reality, the weak practice link and the serious disconnection between industry and education in the teaching of civil engineering in colleges and universities. Many colleges and universities carry out BIM-related courses [2], but the overall teaching effect is not ideal, and the practical operation of the project is not strong. Therefore, it is necessary to analyze the problems existing in the training of BIM talents, propose feasible countermeasures, and strive to improve the teaching ability of teachers' engineering practice [3], so as to transport more BIM technicians to enterprises.

II. ANALYSIS

At present, many universities have set up some BIM-related courses to strengthen the training of BIM talents, but there are some practical problems in the training of BIM talents.

2.1 The knowledge system is not updated in time

The training of civil engineering talents based on BIM often focuses more on the teaching of traditional professional knowledge, without real-time updating of the curriculum knowledge system, which leads to the training of new technology talents in colleges and universities lagging behind the demand of the industry.

2.2 The form of curriculum training is single

Although many colleges and universities have opened BIM-related courses, the training form is too simple, only for the teaching of basic BIM theory, without setting up BIM-related curriculum design, without truly integrating

BIM technology into professional teaching, without considering the current situation of the industry and enterprise for comprehensive application.

2.3 The practical ability of teachers is not enough

At present, many college teachers are directly converted from students to teachers, lacking engineering practice experience and engineering background, only teaching theoretical knowledge, poor practical ability, unable to achieve good communication with the industry, and most teachers have not received BIM-related systematic learning before, only through self-study can meet the basic teaching requirements at most, unable to integrate BIM technology and engineering practice.

2.4 The exchange and cooperation between universities and enterprises is not deep

The exchanges and cooperation between universities and enterprises often stay at a shallow level, such as building teaching practice bases and recommending students for employment, which cannot achieve the common progress of universities and enterprises. The application and promotion of BIM, a new technology, will well drive the upgrading of the whole construction industry. The existing teaching mode still blindly emphasizes the importance of closed on-campus teaching, without going out of the campus to achieve in-depth cooperation between universities and enterprises, which is not conducive to cultivating high-level talents who master BIM technology.

2.5 Professional ability improvement is not active

University teachers are faced with the double pressure of teaching and scientific research, and do not have enough time and energy to devote themselves to teaching. It is easy to appear the phenomenon of heavy theory and light practice. They lack the internal motivation to improve their professional level, lack initiative and consciousness, and do not realize that the professional level of teachers will greatly affect the quality of talent training [4].

III. DISCUSSION

Based on the problems existing in the training of BIM talents, this section discusses the specific measures to cultivate BIM talents from multiple perspectives, so as to cultivate high-quality innovative BIM talents. The implementation measures for BIM talent cultivation is shown in Figure 1.

3.1 Talent training objectives are oriented by industry demand

Teachers should consider the frontier development trend of the industry when formulating talent training objectives, meet the needs of the industry, deepen the integration of industry and education[5]. Through cooperation with excellent enterprises, build a school-enterprise cooperation platform, and form the training objectives and plans of applied, compound and innovative technical and technical personnel with BIM technology as the core, so as to integrate the talent training objectives with the employment needs of enterprises and industries, and actively cultivate BIM technical personnel with large market demand.

3.2 The construction of the teaching team with double teachers and double abilities as the requirements

The key to improving the quality of applied talent training lies in the construction of "double teachers and double abilities" teaching team. At present, the teaching staff in colleges and universities is relatively short of those who master BIM technology, and the practical experience is insufficient. Corresponding measures should be taken to solve this problem. On the one hand, the entrance of new teachers should be strictly controlled, that is, the engineering background can be considered when recruiting teachers, and the teachers with enterprise BIM work experience should be given appropriate bias, so as to ensure that the new teachers have good professional practice ability. On the other hand, to promote the professionalization of existing teachers, that is, to invite experts with rich BIM work experience to carry out BIM-related lectures and training in schools, encourage full-time teachers to participate in practical learning in related enterprises, send teachers to work in enterprises during winter and summer vacations, encourage teachers to carry out diversified engineering project cooperation with related enterprises, actively apply for industry-university-research projects, promote scientific research through teaching, and feed back teaching through scientific research. By improving teachers' teaching ability and professional practice ability, teachers can better integrate with the industry, and strengthen the "double-teacher and double-ability" teacher team.

3.3 Professional curriculum system with BIM technology as the core

With the continuous progress of the new round of scientific and technological revolution and industrial reform, the emerging technologies in the industry are flourishing, and the application of BIM technology has promoted the transformation and upgrading of the civil engineering industry. This technology runs through the whole life cycle of construction projects, involving a wide range of professional aspects. It is necessary to integrate BIM technology, integrate and expand relevant civil engineering professional knowledge, and build a curriculum system with BIM technology as the core. On the one hand, BIM-related software courses are offered to master the basic operation tutorials of BIM modeling software. On the other hand, the BIM technology into the relevant core professional courses, such as the BIM technology and ‘bridge engineering’, ‘housing architecture’, ‘traffic engineering’, ‘municipal engineering’ and other professional courses, is conducive to the study and application of relevant professional knowledge.

3.4 Teaching resources with a diversified characteristics

Teachers should attach great importance to teaching, put the main energy into teaching, create high-quality teaching resources based on BIM, make full use of various network resources, the modern information technology and education and teaching process deep integration, build an independent and flexible learning platform for students, not only limited to the classroom teaching time, but also let students learn BIM-related knowledge after class. In the teaching content of the introduction of BIM technology application examples, to achieve the effective connection of different professional courses, build a BIM teacher learning team, regularly carry out BIM teaching reform seminars, facilitate teachers to exchange teaching experience, mobilize teachers to participate in the enthusiasm of BIM teaching reform, the formation of high quality diversified teaching resources.

3.5 Annual assessment of teachers based on engineering practice

The engineering practice is included in the evaluation content of the annual assessment, which is conducive to improving the engineering practice ability of teachers. Universities can consider the actual situation of the school to give appropriate weight to the teaching ability, scientific research ability and engineering practice ability of teachers, and develop a reasonable assessment system. At the same time, the incentive policy is adopted to give certain material and spiritual rewards to teachers who perform well in engineering practice, and to criticize and punish those who do not actively participate in engineering practice activities and rank low in engineering practice ability assessment.

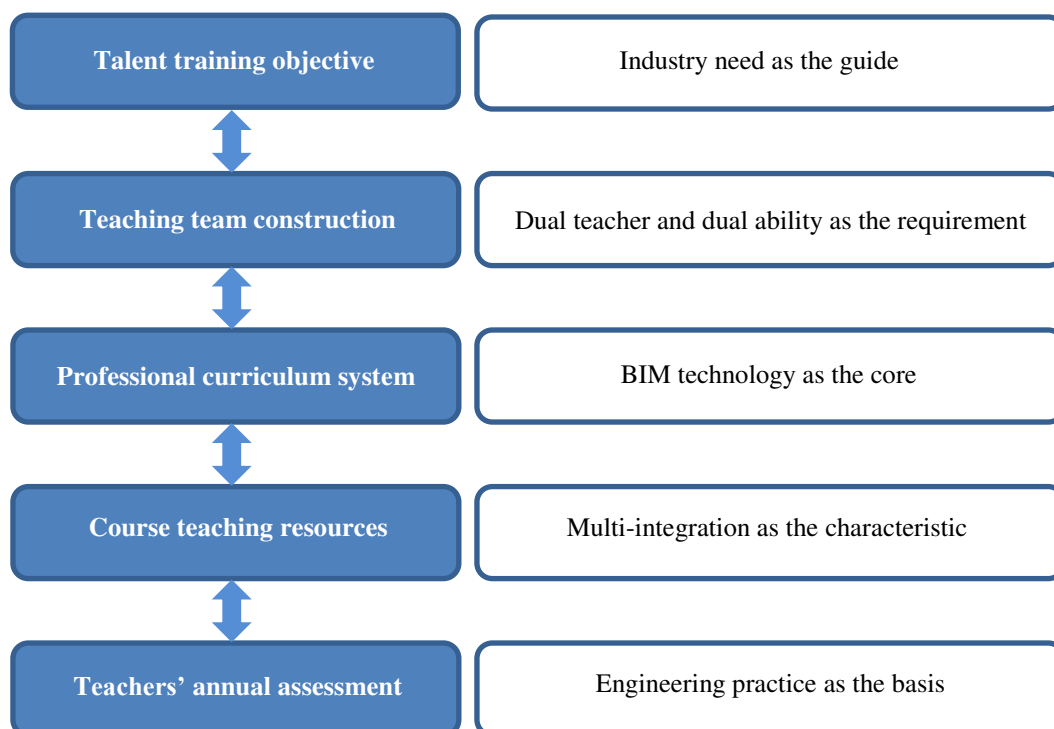


Fig. 1. Implementation measures for BIM talent cultivation



IV. CONCLUSION

The construction of new engineering is a great reform of China's higher engineering education in the new era, which puts forward new challenges to engineering education. We should seize the opportunity to implement BIM technology into the training process of civil engineering specialty, adapt to the new normal of the industry, and improve students' practical and innovative ability. At the same time, whether the reform of engineering education in China is effective largely depends on the teaching level and engineering practice ability of teachers. The high-level teaching staff is the key to adapt to the development needs of the whole era and cultivate high-level engineering talents. University teachers should constantly update their knowledge structure system and deepen the reform and innovation of BIM teaching mode.

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