

The Application of AIGC in BIM Teaching of Prefabricated Buildings under the Blended Teaching Model

Zizun Liu

Chongqing Vocational College of Public Transportation, Chongqing 402247, China

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: Against the backdrop of the construction industry's transition towards industrialization and intelligence, prefabricated buildings have emerged as a core direction for promoting high-quality development in the sector. BIM (Building Information Modeling) technology, as a pivotal tool for lifecycle management in prefabricated buildings, directly influences the effectiveness of professional talent cultivation. The blended teaching model, which integrates the advantages of online and offline instruction, breaks through the temporal and spatial constraints of traditional teaching. Meanwhile, the rapid development of AIGC (Artificial Intelligence Generated Content) technology offers new solutions to address challenges in BIM teaching for prefabricated buildings, such as insufficient practical scenarios, lack of personalized guidance, and outdated teaching resources. This paper analyzes the current status and pain points of BIM teaching for prefabricated buildings under the blended teaching model and proposes targeted application strategies and safeguard measures. The aim is to optimize the BIM teaching process, enhance teaching efficiency and quality, cultivate compound talents in BIM for prefabricated buildings who meet industry demands, and provide theoretical references and practical insights for the reform of teaching in the prefabricated building field.

Keywords: Blended teaching; AIGC; Prefabricated buildings; BIM

Online publication: Jun 11, 2026

1. Analysis of current status and pain points in BIM teaching for prefabricated buildings under the blended teaching model

1.1. Current status of BIM teaching for prefabricated buildings

The integration of prefabricated buildings and BIM technology represents a significant trend in the current development of the construction industry. Vocational colleges and universities offering architecture-related majors have introduced BIM courses for prefabricated buildings and adopted a blended teaching model combining online and offline instruction. Online teaching utilizes internet platforms to disseminate course resources and conduct virtual simulation exercises, while offline instruction strengthens students' practical

skills through hands-on training, case studies, and group discussions. Many vocational colleges have also started collaborating with construction enterprises to introduce project cases, and some have equipped themselves with BIM laboratories and prefabricated building component model teaching aids, achieving an initial integration of theory and practice. However, from a practical teaching perspective, current courses often focus on basic BIM modeling operations, with insufficient coverage of BIM applications throughout the lifecycle of prefabricated buildings. Additionally, the connection between online and offline components in blended teaching is not smooth, and due to limited faculty expertise, teachers with both BIM technical skills and practical experience in prefabricated engineering are relatively scarce. Consequently, it is challenging to deeply integrate industry needs with teaching content during practical instruction, leading to a certain gap between teaching effectiveness and talent cultivation requirements.

1.2. Core pain points in BIM teaching under the blended teaching model

Under the blended teaching model, the core pain points in BIM teaching manifest at multiple levels.

Firstly, online resources are monotonous. The online resources provided by institutions are often static, such as recorded lectures and electronic courseware, resulting in weak interactivity and relevance. This diminishes students' enthusiasm for autonomous online learning and makes it difficult for teachers to accurately assess students' learning outcomes.

Secondly, there is a shortage of hardware and software for practical teaching and training resources. Offline teaching fails to precisely address students' weaknesses identified during online learning. Moreover, BIM teaching places higher demands on practical operations, but the updates to BIM software and hardware in institutions are relatively delayed, leading to insufficient virtual simulation training resources for prefabricated buildings. Students find it difficult to access real-world BIM application scenarios in projects, rendering practical teaching superficial.

Thirdly, an appropriate teaching case system has not been established. Current teaching cases primarily revolve around traditional building projects, with relatively few and insufficiently systematic cases tailored to BIM teaching for prefabricated buildings. Consequently, students cannot gain an in-depth understanding of the key points of BIM technology application in various stages of the lifecycle of prefabricated buildings, including design, component production, and on-site construction, resulting in a disconnect between teaching content and industry trends in prefabricated buildings.

Fourthly, there is a disconnect between teaching content and actual industry needs. The practical BIM technology application requirements and cutting-edge technological methods in prefabricated building projects are not swiftly translated into actual course content during teaching. As a result, institutions still focus on traditional BIM skill transmission, making it difficult for students to deeply match the skills they learn in school with enterprise job requirements. After graduation, students often need to re-familiarize themselves with job tasks, leading to a deviation between talent cultivation and job demands.

1.3. Necessity of applying AIGC in BIM teaching

Firstly, AIGC can help address the pain points of blended teaching resources and practical training, compensating for teaching resource shortcomings. In response to issues such as a scarcity of teaching cases and insufficient training resources for BIM in prefabricated buildings, AIGC can leverage construction industry data and real project information to rapidly generate diverse teaching cases and simulate virtual

training scenarios. Simultaneously, it can formulate personalized online learning recommendations and plans based on students' actual situations, enhancing the relevance and interactivity of online teaching. Additionally, by utilizing virtual reality technology, AIGC can facilitate highly realistic practical training, addressing the problems of outdated hardware equipment and relatively monotonous practical scenarios in institutional teaching, thereby improving the effectiveness of blended teaching.

Secondly, AIGC can drive the upgrading of blended teaching models and talent cultivation to meet industry demands. The existing teaching model fails to effectively cultivate students' AIGC-assisted design capabilities. As industry development gradually moves towards the deep integration of AIGC and BIM technology, incorporating AIGC into BIM teaching can establish an "AI + BIM" blended teaching model. This not only promotes teaching innovation but also ensures that BIM teaching content deeply aligns with industry trends, enabling students to grasp and understand cutting-edge AIGC technology applications in the industry through learning. This closely aligns with the demands for new architectural talents in the context of the construction industry's transformation and upgrading, contributing to enhancing the quality and level of talent cultivation.

2. The application of AIGC in BIM teaching for prefabricated construction under the blended teaching model

2.1. Strengthening the construction of teaching resources

Under the blended teaching model, the primary task of applying AIGC in BIM teaching for prefabricated construction is to strengthen the construction of teaching resources, ensuring sufficient resource support for teaching practice. In practice, leveraging AIGC technology can specifically address the shortcomings of BIM teaching resources for prefabricated construction, thereby resolving issues such as the scarcity of case resources and the monotony of resource formats in current teaching practices. In practice, AIGC technology can deeply integrate with real projects to rapidly generate BIM teaching cases that are closely related to the entire lifecycle of prefabricated construction, embedding core aspects such as design specifications, component fabrication, and construction organization planning into the teaching cases. Relying on architectural terminology databases and prompt templates during the teaching process, standardized practical training task sheets, technical document templates, and other targeted teaching resources can be generated, thereby enriching the resource formats of BIM teaching for prefabricated construction and promoting teaching innovation.

2.2. Promoting the optimization of teaching models

Driving teaching innovation through the deep integration of AIGC and BIM technology can effectively promote the reconstruction of the blended teaching model for BIM in prefabricated construction, thereby breaking away from the disconnected state of online and offline teaching under traditional models. In the online teaching segment, AIGC technology can be utilized to establish an intelligent learning assistance system that deeply integrates students' BIM learning progress and practical operation data, enabling personalized delivery of learning tasks, Q&A resources, and other materials. Additionally, it can simulate the actual work scenarios of BIM projects for prefabricated construction through the platform, allowing students to engage in virtual practical training via online channels and enhancing their practical skills. In offline teaching, AIGC can assist in the practical application of BIM technology, organizing students for group

discussions and analyses. During teaching practice, operations can be carried out following processes such as information extraction, content generation, and manual review, enabling students to complete BIM technical document compilation for real projects through this process. This forms a comprehensive educational model that deeply integrates online virtual training and offline practical application, helping to strengthen students' professional competence and abilities, and enhancing the quality and effectiveness of BIM teaching for prefabricated construction.

2.3. Strengthening the construction of faculty

Faculty development is key to integrating AIGC into BIM teaching for prefabricated construction under the blended teaching model. Therefore, institutions can utilize AIGC to develop exclusive faculty training resources, explaining practical methods of generative AIGC-assisted BIM teaching to teachers during training, helping them broaden their professional horizons, and enabling them to utilize AIGC in teaching practices. Furthermore, institutions should guide teachers to deeply learn the practical operation essentials of AIGC, transforming AIGC into a teaching assistance tool that can assist teachers in organizing BIM professional knowledge points for prefabricated construction, designing professional teaching plans, and pushing cutting-edge technological information on the integration of AIGC and BIM based on the latest industry research findings and actual enterprise needs. This enables teachers to promptly update their knowledge structures, deeply understand AIGC technology, and deeply integrate AIGC into BIM teaching for prefabricated construction, thereby enhancing teaching effectiveness and cultivating a composite faculty team.

2.4. Strengthening student capacity building

Strengthening student capacity building is a crucial aspect of promoting the integration of AIGC into BIM teaching for prefabricated construction. Therefore, AIGC can be fully utilized in teaching to gradually guide students in in-depth learning, such as having students use AIGC to extract information from BIM models and compile technical documents, thereby enhancing their ability levels and enabling them to master BIM practical skills. Additionally, teachers should assign practical training tasks involving AIGC-assisted BIM design for prefabricated construction, allowing students to practice “human-machine collaboration” during task participation, thereby cultivating their innovative thinking and engineering problem-solving abilities. Finally, teaching should deeply integrate with real project case verification processes, enabling students to participate in complete AIGC-assisted BIM project operations, thereby exercising their full-process practical abilities, giving them a profound understanding of cutting-edge industry technologies, and promoting their transformation from traditional skilled talents to “innovative + composite” talents.

2.5. Improving the evaluation system

Relying on AIGC technology for BIM teaching in prefabricated construction requires the improvement of the evaluation system to precisely align with the requirements of the blended teaching model. In practice, AIGC can be utilized for full-process data collection and real-time data analysis of students' online learning behaviors, BIM model operation processes, and technical document compilation results, thereby evaluating students' learning processes ^[1]. Furthermore, the evaluation can deeply integrate architectural professional standards, utilizing AIGC for intelligent initial evaluations of students' BIM practical results and technical document compilation quality, providing evaluation opinions from dimensions such as professionalism and accuracy in this process. Subsequently, teachers conduct manual review evaluations, thereby creating

a comprehensive evaluation model that combines intelligent initial evaluations with manual reviews. After completing the evaluation, the AIGC system provides each student with a personalized ability analysis report, pointing out their ability weaknesses and directions for improvement, enhancing teaching levels and quality^[2].

3. Safeguard measures for the application of AIGC in BIM teaching of prefabricated buildings under the hybrid teaching model

3.1. Improving policy support for teaching reform

Under the hybrid teaching model, the application of AIGC in BIM teaching of prefabricated buildings necessitates the enhancement of policy support for teaching reform. Therefore, institutions should closely align with the transformation and upgrading of the construction industry as well as the development goals of prefabricated buildings, introduce specialized reform policies, and integrate them into the talent cultivation plans and core course content of architectural majors. This will clarify the application positioning of AIGC technology and the implementation standards for BIM teaching of prefabricated buildings^[3]. Simultaneously, corresponding incentive measures should be established to encourage teachers to utilize AIGC for BIM teaching and drive pedagogical innovation centered around it. Finally, detailed implementation rules should be formulated by deeply integrating the characteristics of BIM teaching for prefabricated buildings, thereby standardizing the application process of AIGC in various aspects of hybrid teaching. This will provide clear institutional guidance and safeguards for teaching reform, facilitating its orderly progression^[4].

3.2. Establishing a stable technical support system

Establishing a stable technical support system aids in facilitating the integration of AIGC into BIM teaching of prefabricated buildings, enhancing the effectiveness and quality of hybrid teaching. In practice, institutions should collaborate with technical teams to develop lightweight AIGC-assisted BIM teaching tools and establish data interfaces between BIM and AIGC platforms, enabling precise extraction of model information and intelligent generation of documents in teaching practice scenarios^[5]. Additionally, a technical service platform should be established during teaching practice to provide services such as tool maintenance, version updates, and problem-solving, ensuring the stability of teaching equipment. Continuous updates should also be made to the architectural professional database and teaching prompt template library, providing ample technical support for the integration of AIGC into BIM teaching of prefabricated buildings^[6].

3.3. Increasing investment in teaching

The practical application of AIGC in BIM teaching of prefabricated buildings under the hybrid teaching model necessitates increased investment in teaching, encompassing both hardware and software aspects. On the hardware front, BIM teaching computer lab equipment should be promptly updated, equipped with computers and servers compatible with AIGC technology, and an integrated online-offline teaching and training platform should be established to meet the synchronous training needs of BIM modeling and AIGC practical operations^[7]. From a software perspective, institutions should purchase genuine AIGC teaching platforms, BIM software, and prefabricated virtual simulation resources to ensure ample resource support for teaching practice and enhance teaching levels and effectiveness^[8].

3.4. Promoting alignment between teaching and industry practice

Deep alignment between teaching and industry practice is crucial for enhancing the quality of hybrid teaching and facilitating the in-depth application of AIGC in BIM teaching of prefabricated buildings. Therefore, a collaborative education model between institutions and enterprises should be established to promote the deep integration of AIGC teaching applications with industry practice^[9]. In practice, “AIGC + BIM” training bases can be jointly established with social prefabricated building enterprises, incorporating real enterprise project cases, the latest AIGC application technologies, and industry standards to effectively transform actual enterprise project processes into teaching and training content. Additionally, institutions should strengthen cooperation with external experts during teaching practice, jointly develop training projects and course resources with them, and organize students to participate in real projects, effectively aligning teaching content with real job requirements and enhancing students’ practical skills and professional competence^[10].

4. Conclusion

The study reveals that the application of AIGC in BIM teaching of prefabricated buildings under the hybrid teaching model faces numerous challenges, spanning multiple dimensions such as resources, modes, faculty, and evaluation. The practical application of AIGC technology can overcome current teaching limitations and achieve teaching innovation from dimensions such as resource construction and mode optimization. Furthermore, corresponding safeguard measures can provide support for the practical application of AIGC technology in BIM teaching of prefabricated buildings, facilitating their deep integration. This effectively enhances students’ professional competence and skills, nurturing a continuous stream of “AIGC + BIM” composite architectural talents for the development of the prefabricated building industry. In the future, the integration of AIGC and BIM teaching in prefabricated buildings will evolve towards intelligence and depth, with human-machine collaboration becoming the mainstream of teaching practice. Subsequent research can seek breakthroughs in directions such as quantitative evaluation of AIGC teaching effectiveness and the development of personalized teaching systems to further promote and deeply integrate AIGC into BIM teaching of prefabricated buildings, driving high-quality development in architectural education.

Funding

Research on the Application and Teaching Practice of AIGC in BIM for Prefabricated Buildings (Project No.: YSKY2025-21)

Disclosure statement

The author declares no conflict of interest.

References

- [1] Zhao J, 2025, Application of AI and Big Data Technologies in the Design and Construction of Prefabricated Buildings. *Computer Purchasing*, 2025(9): 50–52.
- [2] Liu T, 2025, A Brief Discussion on the Application of Intelligent Technologies in Leak Prevention for

- Prefabricated Buildings. *China Architectural Decoration*, 2025(22): 73–75.
- [3] Wang L, Zhang J, 2024, Analysis of the Application Prospects of AIGC Technology in the Construction Industry. *Information Technology in Civil and Architectural Engineering*, 2024(1): 45–51.
- [4] Chen H, et al., 2022, Research on the Intelligent Generation Method of Building Codes Based on GPT. *Computer Engineering and Applications*, 2022(15): 234–240.
- [5] Zhao X, Liu Y, 2023, Discussion on the Technology Path for the Integration of BIM and AI in Prefabricated Buildings. *Architectural Technology*, 2023(3): 321–326.
- [6] Li Y, Wang L, Qin S, 2024, Research on the Risk Conduction Relationship in the Supply Chain of Prefabricated Buildings Based on DEMATEL-AISM. *Value Engineering*, 43(28): 42–44.
- [7] Fan W, 2023, Research on the Teaching Application of BIM Technology in Architectural Majors in Higher Vocational Education. *Chat*, 2023(10): 166–168.
- [8] Xin N, 2026, Research on the Teaching Reform Path of Architectural Decoration Engineering Under the Dual-Core Drive of “BIM + AI”. *Journal of Jiamusi Vocational Institute*, 42(2): 209–211.
- [9] Li Q, 2025, Exploration of Teaching Reform in the Course of Building Architecture Based on Artificial Intelligence Technology. *Stone*, 2025(11): 158–160.
- [10] Xie M, 2025, Research on the Innovation of Teaching Models in Architectural Decoration Engineering Technology Under AI Drive. *China Flight*, 2025(14): 158–160.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.