

# Research on Teaching Reform and Practice of Architecture Major Based on Green Building Technology

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**Abstract:** With the development of the social economy and the upgrading of residents' consumption concepts, new requirements have been put forward for buildings, which need to break through traditional functional and spatial limitations and attach importance to comfort and low-carbonization. To meet the needs of social development, in the training of architectural professionals in higher vocational colleges, it is necessary to realize the combination of key points and the overall situation, strengthen the connection between theory and practice, help students understand green building technologies, and develop good professional architectural skills. Starting from the teaching level of architectural majors in higher vocational colleges, this paper analyzes the value of integrating green building technologies and puts forward specific teaching reform strategies, aiming to improve the quality of talent cultivation in architectural majors and accumulate experience for subsequent professional teaching reforms.

**Keywords:** Green building technology; Higher vocational education; Architectural professional teaching

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## 1. Introduction

The level of urbanization in China is increasing day by day. With the support of economic foundation and science and technology, it is necessary to improve the level of the construction industry. In the current era, residents have put forward more stringent requirements for construction projects. They not only need to have basic use value, but also need to show characteristics such as artistry and sustainable development. In combination with the development of the times, engineering construction activities in the construction industry need to implement the concept of low carbon, flexibly use low-carbon and environmental protection measures, effectively reduce damage to the environment, and reduce energy consumption. In the teaching of higher vocational construction engineering majors, it is necessary to attach importance to the training of professional talents, effectively exert the social value of talents, and infiltrate the concept of green buildings, so that students can participate in subsequent practices,

strengthen the application of green building technologies, participate in subsequent engineering construction, effectively meet social needs, and accelerate the development of the construction industry.

## **2. The value of integrating green building technology into the teaching reform of architectural majors in higher vocational education**

Environmental issues are key issues in social development. In the long-term development process, the existence of related problems has hindered the healthy development of the economy. To effectively address these challenges, China has advocated the concept of green development to tackle severe environmental pollution and resource waste <sup>[1]</sup>. Integrating the concept of green development into the production and labor of various industries can prioritize environmental protection and accelerate the healthy development of all sectors. The promotion of such approaches can not only speed up the development of various industries but also promote the sustainable development of society.

In the higher vocational education system, the architectural major occupies a pivotal position. The teaching of this major is closely linked to social development, which can accelerate urbanization and provide support for infrastructure construction. From the perspective of real life, in the construction of urban buildings and the increasing improvement of rural infrastructure, talents trained by higher vocational architectural majors are often active on the front line, contributing to the healthy development of society <sup>[2]</sup>. With the emergence of global environmental problems, the concept of green development has gradually become a consensus of the times and truly gained popular support. Based on this, the integration of the green development concept with architectural professional teaching has exerted important value. In the development of the traditional construction engineering industry, there are problems such as resource consumption and environmental pollution, and the infiltration of the green development concept can provide new ideas for solving these problems. In the education process of higher vocational architectural majors, the integration of green building technology can effectively innovate teaching methods and cultivate high-quality, skilled talents who meet the needs of the times <sup>[3]</sup>. At the level of curriculum design for architectural majors, it is necessary to pay attention to enriching content, adding knowledge about renewable resources and green building technologies, to help students master basic knowledge and deeply understand the connotation of green and low-carbon development. From the perspective of practical teaching, green building cases can be infiltrated to guide students to participate in analysis and discussion activities, effectively cultivating their green and low-carbon concepts and enabling them to adjust engineering design and construction. From the perspective of social development, the integration of architectural majors with the concept of green development can contribute to the sustainable development of society <sup>[4]</sup>. As residents' requirements for quality of life increase, higher demands are placed on green buildings. To meet residents' needs, higher vocational architectural majors in their talent cultivation must foster students' awareness of green buildings, help them adapt to the needs of social development, and accelerate the healthy development of the construction industry.

## **3. Teaching practice strategies for higher vocational architecture majors based on green building technology**

### **3.1. Integrate the concept of green building and adjust professional teaching**

In higher vocational architecture majors, the teaching content covers architectural drawing, house construction,

etc. During the learning process of professional knowledge, students can master relevant knowledge proficiently. To improve the effect of professional education, teachers need to keep up with the development of the times, carry out innovative activities, effectively implement the concept of green building, and promote the realization of building energy conservation goals <sup>[5]</sup>. In the teaching of architecture professional courses, students can learn knowledge such as planning and design, project site selection, and think about how to improve building energy conservation standards under the background of meeting building efficiency and functions, and conduct in-depth thinking from aspects such as building material selection and structural layout.

For example, when teaching content related to architectural design, teachers can encourage students to integrate the concept of green buildings into their work, adjust architectural engineering designs, and advocate for the design of energy-saving and environmentally friendly curtain walls. Teachers can guide students to participate in high-rise building design, follow energy-saving principles, leverage the characteristics of high-rise buildings, and convert the heat stored in maintenance materials to provide green energy output for systems such as pipeline systems and ventilation systems, which are the weak points of high-rise buildings. This ensures the normal operation of some energy-consuming systems, effectively reduces energy consumption, and meets green building standards <sup>[6]</sup>. Meanwhile, when explaining content related to building materials, teachers can encourage students to choose green materials, make use of their characteristics of low energy consumption and easy recyclability, conduct research on green building material manufacturing technologies, and select appropriate types of materials to promote the achievement of green building design goals. In addition, when dealing with content related to architectural engineering design, teachers can encourage students to apply the concept of green buildings in designing architectural engineering structures, effectively implement green concepts, and adjust links such as architectural engineering construction and operation, thereby contributing to the green development of the construction industry <sup>[7]</sup>. The integration of the green building concept in the teaching process of architecture majors can help students master professional knowledge, effectively carry out green, energy-saving, and low-carbon designs, and practically meet the green building engineering standards proposed by society. Under the influence of the green building concept, architecture teachers need to help students clearly understand the content of the green building concept and its importance, and provide appropriate guidance to assist students in engaging in professional knowledge learning and effectively implementing green building concepts. In professional course teaching, teachers can also use practical activities, lectures, and other forms to encourage students to master green building cases <sup>[8]</sup>. To help students understand the green building concept, it is also necessary to guide them to write relevant papers and reports, so that they can proficiently grasp this concept.

### **3.2. Developing a curriculum system to enhance educational outcomes**

To successfully achieve the goals of green building construction, it is not only necessary to integrate and superimpose technologies but also to optimize their integration. This places higher demands on professionals, who must possess solid foundational expertise and be capable of operating active building equipment. However, for architecture programs in vocational colleges, the fundamental educational objective is to help students systematically master basic theories and skills. Guided by the standardized requirements for architecture programs, many vocational colleges have structured their architecture courses with close interconnections but insufficient differentiation. Courses related to green building technologies primarily fall under the knowledge system of building technology, covering content such as site design, green building principles, and building

equipment <sup>[9]</sup>. Typically, instructors of different courses have varying professional backgrounds. To develop a robust green building curriculum system, it is essential to strengthen the connections between knowledge from different courses. Educators should build upon traditional knowledge frameworks, emphasize the integration of new concepts and technologies, and effectively enrich the connotation of the curriculum.

Furthermore, green building refers to the integrated and optimized application of green building technologies throughout the design, construction, and other stages. From a curriculum perspective, its knowledge structure intersects with various architecture-related courses. For instance, site design is closely linked to land use; during the design process, it is crucial to leverage site advantages and ensure harmony with ecological landscapes and the surrounding environment <sup>[10]</sup>. Building structures and configurations provide the “skeleton” of a building, ensuring its durability and stability. While configurations focus on green building materials, structural studies analyze the mechanical relationships between different components. For a practical green building technology curriculum system, vocational colleges must incorporate hands-on training components. Through industry-academia collaboration and the development of training bases, students can gain exposure to real green building projects, actively participate in practical activities, and deeply internalize green building concepts <sup>[11]</sup>. Additionally, introducing real-world cases for students to analyze and discuss can enhance their problem-solving and innovation capabilities.

### **3.3. Skillfully utilizing information models to cultivate the concept of green buildings**

In the context of the new era, to effectively improve the effectiveness of teaching, it is necessary to strengthen the use of advanced technologies and promote the innovation and development of teaching models <sup>[12]</sup>. In the teaching practice of architecture majors, building information models can be used to make professional teaching more effective. Through the application of building information models in teaching practice, teachers can use computers for simulation to intuitively present construction projects. These models can cover various links such as project construction and acceptance, promoting the realization of periodic management of construction projects. At the same time, the use of building information model technology can test the buildings designed by students to determine whether the concept of green buildings is integrated. For example, when teaching content related to construction engineering technology, teachers can, based on students' situations, integrate the concept of green buildings into the teaching, design good construction projects, encourage students to apply design drawings, build virtual buildings with the help of information model technology, and analyze their impact on the environment. After the above test activities, teachers can understand students' architectural works and conduct scientific evaluations <sup>[13]</sup>. The implementation of the above teaching activities can enable students to actively participate in course learning, clearly and intuitively understand the application methods of green building technologies, clarify the role played by the concept of green buildings, and recognize their importance. Thus, it can improve the effect of professional learning and effectively enhance students' comprehensive quality.

### **3.4. Strengthen teacher training and adjust professional courses**

In the traditional courses of higher vocational architecture programs, although the basic principles contained in relevant technologies remain roughly the same with continuous development, there are significant differences in their design concepts and engineering applications. Due to the strong practical nature of the architecture major, when it comes to the transmission of professional knowledge, the explanation of knowledge principles is fundamental, but a key point is to help students master theoretical knowledge and be able to share and



practice practical experiences in different contexts <sup>[14]</sup>. Based on this, the construction of the teaching staff for architecture majors in higher vocational colleges can proceed from the following perspectives: First, in view of teachers' professional backgrounds, corresponding echelons can be formed to carry out in-depth exchanges, integrating green building technologies into various courses such as architecture, water supply and drainage, and electrical engineering. Second, colleges can invite professionals from enterprises to work as part-time teachers to provide support for the teaching of green building technologies. At present, among the teaching staff of architecture majors in higher vocational colleges, most teachers focus on scientific research activities and have insufficient engineering experience. However, enterprise engineers, who are long engaged in front-line work, lack sufficient energy to improve their academic qualifications, resulting in a situation where both academic qualifications and experience cannot be obtained. To address the above problems, the following measures can be taken to effectively build the teaching staff <sup>[15]</sup>. On the one hand, higher vocational colleges can encourage teachers to participate in the school's relevant infrastructure projects and actively engage in practical training in construction enterprises to gain more engineering experience. On the other hand, higher vocational colleges need to provide exchange and teaching platforms for enterprise engineers. In the practice of professional architecture courses, engineers are encouraged to use their own experience to conduct discussions on practical cases. The implementation of the above teaching practices can give play to the guarantee role of curriculum arrangements and truly achieve implementation and continuity.

## 4. Conclusion

To sum up, the content of the architecture major includes knowledge of building structures, materials, and aesthetics, making it an interdisciplinary profession. Professional teaching activities are easily influenced by social and industry demands. In the context of the current era, to improve the teaching quality of architecture majors, higher vocational colleges can integrate green building technologies, carry out systematic professional teaching activities, and formulate comprehensive plans to ensure a truly progressive approach. Specifically, higher vocational colleges can adopt measures such as infiltrating the concept of green buildings and strengthening the construction of teaching staff, enhancing the connection between theory and practice, applying green building technologies to curriculum practice, improving students' comprehensive quality, and providing a guarantee for their healthy development.

## Disclosure statement

The author declares no conflict of interest.

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