Research on the International Training Model for Intelligent Building Professionals Based on CAFTA

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Abstract. Under the framework of the China-ASEAN Free Trade Area (CAFTA), this paper explores innovative practices for the international training model of intelligent building professionals. First, it analyzes the current development status of intelligent building talent, clarifying the professional requirements and conceptual definitions. Then, it discusses the characteristics of the demand for intelligent building professionals in the context of CAFTA, emphasizing the importance of an international perspective, cross-cultural communication skills, and comprehensive qualities and innovation abilities. Based on this, it proposes measures such as constructing an international talent training system, diverse learning methods, and supporting student innovation and entrepreneurship. By establishing internship bases, conducting international collaborative research, and organizing international academic exchanges, the aim is to enhance students' international competitiveness. Combined with policy support and specific measures from universities, the goal is to cultivate high-quality intelligent building professionals with a solid theoretical foundation and rich practical experience, providing essential talent support for the sustainable development of regional economy and society.

Keywords: China-ASEAN; intelligent building; training model; internationalization.

1 Introduction

Intelligent Building is an innovative outcome combining modern building technology and information technology. Through the application of sensor technology and the Internet of Things (IoT), both China and numerous countries worldwide regard Intelligent Building as a key aspect of modern urban development, aiding sustainable city growth through intelligent management and efficient operation. Concurrently, with the establishment of the China-ASEAN Free Trade Area (CAFTA), the cooperation between China and ASEAN countries has deepened across various fields. CAFTA requires professionals not only to possess solid technical skills but also to have cross-cultural communication and collaboration abilities. Hence, enhancing international

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talent training, especially for those with professional knowledge and a global perspective, has become a critical task shared by all nations.

The international training of intelligent building professionals is a complex system engineering task that requires the combined efforts of the government, universities, and enterprises. Through policy support, educational innovation, and university-industry collaboration, the quality of intelligent building professional training can be continuously improved to meet the ever-increasing demands of industry development. Currently, the field of intelligent building talent training faces multiple challenges. As the concept and technology of intelligent buildings are still evolving, there are differences in standards, regulations, and applications worldwide, adding complexity to professional training. Moreover, existing training systems often focus on domestic needs and lack an international perspective. Therefore, under the CAFTA framework, the need for intelligent building professionals with a global vision, cross-cultural communication skills, and innovative thinking has become a significant issue for all countries[1-2].

This paper will explore three main aspects. First, it will examine the current status of intelligent building talent and reveal existing problems. Second, it will analyze the specific needs for intelligent building professionals in the context of CAFTA and regional development requirements. Third, it will explore new models for the international training of intelligent building professionals, including curriculum design, school-enterprise cooperation, and international exchanges. Through these discussions, this paper aims to provide theoretical guidance and practical direction for the international training of talent in the field of intelligent buildings.

2 Current Development Status of Intelligent Building Talent

2.1 Concept of Intelligent Building

Intelligent Building leverages modern information technology and automation control technology to endow buildings with "intelligence." This building model can comprehensively perceive, accurately analyze, and promptly respond to various situations. Through the deep integration and application of advanced technologies such as the Internet of Things (IoT), cloud computing, and big data, it achieves intelligent management of building energy consumption, environmental quality, safety monitoring, and other aspects. For example, intelligent buildings can monitor and adjust indoor environmental parameters in real-time to achieve energy-saving and environmental protection effects. Additionally, they focus on user experience, offering more convenient and personalized services through smart home systems and mobile applications. Whether it is intelligent office buildings, residential communities, smart campuses, or hospitals, intelligent buildings are creating more comfortable, efficient, and sustainable living and working environments for us, becoming a crucial development direction in modern urban construction [3-4].

2.2 Demand for Intelligent Building Development within the CAFTA Regionreen vocational education

Modernization of Infrastructure and Demand for Intelligent Buildings.

In the context of rapid urbanization and industrialization among CAFTA member countries, the modernization of infrastructure becomes particularly crucial. Intelligent buildings, as a core component of modern infrastructure, play a key role in enhancing urban management and improving the quality of life for residents. By employing advanced energy management systems, intelligent buildings achieve energy savings and emission reductions, lowering operational costs. Additionally, with smart security and emergency management systems, they significantly enhance the safety and emergency response capabilities of buildings. As urbanization progresses, the demand for intelligent buildings and their specialized talent will continue to grow.

Technological Innovation and Application of Intelligent Buildings.

The development of intelligent buildings relies on continuous innovation in cutting-edge technologies such as the Internet of Things (IoT), artificial intelligence (AI), and big data. The rapid advancement of these technologies requires professionals to continuously learn and master new knowledge to drive technological innovation and practical application. For example, IoT enables interconnectivity and real-time monitoring between devices, AI optimizes environmental regulation and energy consumption management, and big data analysis provides scientific foundations for building management. Therefore, there is an urgent need for professionals proficient in these new technologies within the CAFTA region.

Cross-National Cooperation and Intelligent Building Project Management.

Intelligent building projects within the CAFTA region often involve multinational cooperation, requiring professionals not only to be proficient in intelligent building technologies but also to have experience in cross-cultural communication and international project management. They need to effectively communicate, coordinate resources, and solve problems in diverse cultural environments to ensure the smooth implementation of projects. Thus, cultivating professionals with an international perspective and cross-cultural communication skills is crucial for advancing the development of intelligent buildings in the region.

Integration of Smart Cities and Intelligent Buildings.

As an essential component of smart cities, intelligent buildings provide foundational support for the intelligent management of cities and the improvement of residents' quality of life. They work closely with smart transportation, smart energy, smart healthcare, and other systems to jointly promote the sustainable development of cities. Consequently, the construction of smart cities within the CAFTA region urgently requires a large number of professionals with skills in intelligent building technologies and management to accelerate urban intelligence and achieve regional prosperity. By cultivating and attracting such talent, the intelligent building industry in the

region will be strongly propelled forward, significantly contributing to sustainable development and enhancing urban management levels.

By training intelligent building professionals with an international perspective and cross-cultural communication abilities, the intelligent building industry within the CAFTA region will gain robust development momentum. Furthermore, the development of intelligent buildings will significantly contribute to sustainable development, enhanced urban management, and improved quality of life for residents in CAFTA member countries [5].

2.3 Characteristics of Professional Talent Demand in the CAFTA Region

In the context of CAFTA, the demand for intelligent building professionals is increasingly evident as the industry represents high-tech development. The international demand for intelligent building professionals is prominently reflected in three main aspects:

Under the globalization framework, intelligent building professionals need to possess an international perspective and a deep understanding of global trends and technical standards in intelligent building development. This requires them to be familiar with international markets and the latest technologies, as well as having a comprehensive grasp of global economics, culture, regulations, and standards. Professionals with an international perspective can keep pace with the updates in intelligent building technologies and standards and actively participate in global technical exchanges and cooperation. Therefore, they must master the latest international intelligent building technologies and understand the best practices and cutting-edge trends in various countries.

Professionals with an international perspective can apply and promote advanced technologies in multinational projects, driving innovation and development in intelligent buildings. In cross-national cooperation projects, they can introduce internationally advanced intelligent building solutions into local projects, enhancing technical levels and management efficiency. They are also capable of designing and constructing according to international standards and norms, ensuring project quality and safety.

Considering the cultural diversity of CAFTA member countries, intelligent building professionals must possess cross-cultural communication skills. This ability enables them to effectively communicate and collaborate in multicultural environments, understanding and respecting the habits, communication styles, and management practices of different cultural backgrounds. In intelligent building projects involving China and ASEAN countries, professionals with this ability can promote team harmony and cooperation, avoid cultural conflicts, and thus improve project execution efficiency and success rates.

The intelligent building field requires professionals to have interdisciplinary integration abilities and innovative thinking. This means they need to organically integrate knowledge from architectural design, information technology, electrical engineering, and other fields to address industry challenges. Professionals with these abilities not only possess profound professional knowledge and good professional ethics

but also demonstrate excellent teamwork skills and flexible adaptability. In a rapidly changing environment, their innovative capabilities allow them to propose new ideas and technologies, driving the progress of intelligent buildings, and improving building efficiency, safety, and sustainability. Additionally, they can effectively integrate resources and solve problems within projects, contributing significantly to the development of smart cities.

By cultivating intelligent building professionals with an international perspective, cross-cultural communication skills, and interdisciplinary innovation abilities, the CAFTA region can drive the intelligent building industry forward robustly. This development will, in turn, significantly contribute to the sustainable development, enhanced urban management, and improved quality of life for residents in CAFTA member countries.

3 Innovative Practices in the International Training Model for Intelligent Building Professionals

3.1 Constructing an International Training System for Intelligent Building Professionals

Establishing a Multidisciplinary Integrated Curriculum.

In recent years, governments and educational institutions worldwide have introduced policies to encourage higher education curriculum reform and the cultivation of interdisciplinary talents. The Chinese Ministry of Education, in its "14th Five-Year Plan for National Education Development," emphasizes the need to promote multidisciplinary integration and nurture new interdisciplinary specialties.

In the curriculum system for intelligent building majors, it is necessary to integrate knowledge from architecture, information technology, environmental science, management, and other disciplines (Table 1). By incorporating the latest intelligent building case studies, the curriculum should include content on smart cities, green buildings, and intelligent operation and maintenance to ensure that students can master cutting-edge knowledge and skills.

Optimizing Faculty Development.

The Ministry of Education's document, "National Standards for Teaching Quality in Undergraduate Professional Programs," explicitly states the need to build high-level faculty teams and encourages teachers to participate in international academic exchanges and collaborative research. To enhance the internationalization of the faculty, several measures can be taken:

Promote International Faculty Training: Implement overseas training and visiting scholar programs for teachers to improve their international teaching abilities and research levels.

Recruit International Talent: Hire foreign experts and scholars with an international perspective and rich practical experience to serve as course lecturers or co-supervisors.

Establish University-Industry Collaboration Mentor Systems: Invite industry experts and internationally renowned scholars to jointly guide students, providing teaching support that combines theory with practice.

Establishing a Shared Teaching Resource Platform.

Building an international teaching resource-sharing platform for intelligent buildings is an important approach to improving teaching quality and resource utilization efficiency. National and local governments support universities in creating high-quality online courses and resource platforms through various policies. These initiatives not only encourage universities to undertake innovative practices in the field of intelligent buildings but also promote the modernization of educational and teaching models, providing a solid foundation for cultivating outstanding talents with a global perspective.

The intelligent building program can leverage modern information technology to build an international teaching resource-sharing platform that integrates textbooks, courses, case libraries, and virtual laboratories. This platform would provide high-quality teaching resources and case studies from around the world, fostering resource sharing and collaborative innovation.

3.2 Practical Approaches to the International Training of Intelligent Building Professionals

Promoting University-Industry Collaboration and International Exchange.

To advance the training of intelligent building professionals, it is essential to deepen university-industry collaboration and expand international exchanges. Specifically, establishing intelligent building internship bases in collaboration with enterprises and research institutions can provide students with opportunities to participate in real projects, such as intelligent building design and building IoT system development. This practical experience not only enhances students' hands-on skills and industry knowledge but also improves their employability. Additionally, strengthening international collaborative research projects is crucial. By participating in cutting-edge technology research, such as intelligent building energy management optimization, students can gain comprehensive theoretical and practical training.

Developing Diverse Learning Methods.

To meet the training needs of intelligent building professionals, diverse learning methods should be developed. Firstly, a blended teaching model that combines online and offline instruction can provide students with flexible and varied learning experiences. Online courses facilitate personalized learning and self-paced progress, while offline classes promote in-depth understanding and application of knowledge. Secondly, project-based learning can effectively enhance students' innovation and practical abilities. By participating in the entire process of intelligent building projects, students not only develop teamwork and project management skills but also identify problems and seek solutions in practice. Finally, encouraging students to participate in

exchange programs for short-term study and exchange broadens their horizons and enhances cross-cultural communication skills.

Supporting Student Innovation and Entrepreneurship.

In the context of higher education reform, supporting student innovation and entrepreneurship is particularly important. To this end, the intelligent building curriculum should include courses on innovation and entrepreneurship, such as innovation management and entrepreneurial theory, to help students build a solid theoretical foundation and enhance their practical innovation abilities. Additionally, establishing innovation and entrepreneurship incubation platforms can provide students with professional entrepreneurial guidance, consulting services, as well as support in terms of space and funding. Organizing and participating in various innovation and entrepreneurship competitions and activities is also key. These initiatives can not only stimulate students' entrepreneurial enthusiasm but also provide platforms for showcasing their talents and attracting investment. Through these measures, we can effectively cultivate intelligent building professionals with innovative thinking and entrepreneurial capabilities.

4 Rural Revitalization Background of Guangxi Construction Class Professional Green Vocational Education Implementation Path Exploration

As a core component of smart cities, intelligent buildings are increasingly leading the global development trends in the construction industry. Against the backdrop of CAFTA's establishment, new challenges and requirements have emerged for the cultivation of high-quality, comprehensive professionals. With the increasing demand for professional talent and the high requirements for their comprehensive qualities, the international training model for intelligent building professionals has become increasingly important. This paper clarifies the concept of intelligent buildings and the current state of talent cultivation, and it deeply analyzes the specific demands of the industry for professional talent. Additionally, by reviewing the development history of CAFTA, this paper explores the international trends in intelligent building development and their guiding role in talent cultivation.

Furthermore, this paper proposes the construction of an international talent training system and innovative practice models to meet the development needs of intelligent buildings in the region and the requirements for talent characteristics. Throughout this process, the close integration of theory and practice is emphasized, promoting the process of international education. The aim is to cultivate intelligent building professionals with a global perspective, practical skills, and innovative spirit. To address the increasingly complex technical challenges, future educational models should reinforce interdisciplinary integration, such as combining architecture, information technology, and management, while also strengthening cooperation with enterprises and industries to enhance students' practical abilities and problem-solving skills.

5 Conclusions

This study focuses on the cultivation and international education of professionals in the intelligent building field within the framework of the China-ASEAN Free Trade Area (CAFTA). By accurately analyzing the current situation and demands, it clarifies the optimization directions for the education and training system. Strategies proposed include constructing a multidisciplinary curriculum system, strengthening faculty teams, and deepening university-industry cooperation, aiming to enhance students' international competitiveness. Additionally, the study calls for continuous policy support and practical innovation to stimulate students' potential, promote entrepreneurial vitality, and contribute to the sustainable development of the intelligent building industry and regional economy and society.

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References

1. Shi, C., & Zhang, J. H. (2018). Talent demand forecast for China-ASEAN Free Trade Area under the "Belt and Road" initiative. Guangxi Social Sciences, (03), 55-59.
2. Chen, J. B. (2015). Environmental factors and development strategies for developing higher education service trade in Guangxi under the background of CAFTA. Southern Journal, (02), 49-51+27.
3. JWang N. Study of Education and Training Mechanism of China-ASEAN Cross-cultural Communication and Media Professionals[C]//2016 3rd International Conference on Education, Language, Art and Inter-cultural Communication (ICELAIC 2016). Atlantis Press, 2016: 709-714.
4. Bi S. Cooperation between China and ASEAN under the building of ASEAN Economic Community[J]. Journal of Contemporary East Asia Studies, 2021, 10(1): 83-107.
5. Ali M. Vocational students' perception and readiness in facing globalization, industry revolution 4.0 and society 5.0[C]//Journal of Physics: Conference Series. IOP Publishing, 2021, 1833(1): 012050.