Training Mode of Urban Design Professionals Oriented to Smart Cities

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Abstract: This paper mainly discusses the new training mode of urban design professionals for smart cities, in order to meet the demand for professionals in the rapid development of smart cities. Firstly, this paper analyzes the current situation and problems of urban design professionals training. In order to solve these problems, this paper puts forward the necessity and urgency of constructing a new training mode for urban design professionals facing smart cities. A new model is constructed, which includes the goal and orientation of talent training, the reform of curriculum system and teaching content, the innovation of teaching methods and means, the construction of teaching staff and teaching resources. At the same time, this paper also puts forward corresponding implementation strategies, including policy support and guarantee mechanism, school-enterprise cooperation combined with Industry-University-Research, quality evaluation and continuous improvement. The research shows that the new training mode of urban design professionals for smart cities is helpful to improve students' comprehensive quality and innovation ability, and better adapt to the actual needs of smart city construction. It not only optimizes the curriculum system and teaching content, but also innovates teaching methods and means, strengthens the construction of teachers and teaching resources, and provides strong support for the cultivation of urban design professionals.

1. Introduction

With the rapid development of science and technology and the deepening of globalization, smart cities, as a brand-new urban form and development model, are rapidly emerging around the world [1]. By integrating advanced scientific and technological means such as information technology, communication technology and Internet of Things technology, smart cities realize intelligent, efficient and refined urban management, thus improving the quality of life of urban residents and promoting the sustainable development of cities [2].

Urban design, as an important means of shaping urban image and spatial quality, plays a vital role in the construction of smart cities [3]. Smart cities put forward new requirements and challenges to urban design, which needs to be innovated and upgraded in concepts, methods and technologies to meet the development needs of smart cities [4]. At the same time, urban design also needs intelligent means to improve design efficiency, optimize design scheme and enhance operability and sustainability of design implementation [5].

The research on the training mode of urban design professionals facing smart cities is of great significance for improving the comprehensive quality and ability level of urban design professionals and promoting the construction and development of smart cities [6]. At present, there are many problems in the cultivation of urban design professionals, which seriously restrict the growth and development of urban design professionals [7]. This study aims to clarify the specific needs of smart cities for urban design talents, including knowledge structure, skill level, practical ability and innovation ability. Through in-depth analysis and research on the development trend and characteristics of smart cities, as well as the role and position of urban design in smart cities, the specific requirements and standards of smart cities for urban design talents are determined.

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2. Interactive relationship between smart city and urban design

2.1. The concept and characteristics of smart cities

A smart city refers to a modern urban form that realizes intelligent management and services in various fields of the city by comprehensively applying modern information technology, communication technology, Internet of Things technology and other means, and improves the operational efficiency of the city, the quality of life of residents and the ability of sustainable development [8]. Smart cities emphasize the deep integration of information technology and urban development, aiming at building a convenient, efficient, green and safe urban living environment. The main features of a smart city include the contents in Table 1:

Table 1 Main characteristics of smart cities

Serial number	Characteristic	Specific description
1	Comprehensive perception	Real-time monitoring and comprehensive perception of urban operation status are realized through technologies such as the Internet of Things, including traffic, environment, energy, public safety and other fields.
2	Intelligent decision-making	Based on big data analysis and artificial intelligence technology, intelligent decisions are made on urban management and services to improve the efficiency and accuracy of urban governance.
3	Establish and strengthen partnerships	Realize the information sharing and collaborative work among various departments and systems in the city, break the information island and improve the integrity and coordination of urban management.
4	Continuous innovation	Through technological innovation, management innovation, system innovation and other means, promote the sustainable development of the city, improve the competitiveness of the city and the quality of life of residents.

2.2. The concept and practice of urban design

Urban design is an interdisciplinary work that pays attention to urban planning and layout, urban appearance, open space, transportation system, natural and artificial environment, historical and cultural heritage protection and other important issues of urban development. It aims to create a livable, beautiful and distinctive urban environment by comprehensively applying multidisciplinary knowledge such as planning, architecture, landscape, transportation and ecology [9]. With the development of the times, the concept and practice of urban design are constantly evolving, from the initial emphasis on aesthetics and functionality to the subsequent attention to multiple values such as ecology, culture and social justice. The core concepts of contemporary urban design include the contents in Table 2:

Table 2 The core idea of contemporary urban design

Serial number	Core idea	Specific description
1	People-oriented	It is emphasized that urban design should meet people's needs, improve people's quality of life and create a livable, convenient and safe urban environment.
2	Sustainable development	Pay attention to ecological protection, resource conservation and recycling, and promote the green, low-carbon and sustainable development of the city.
3	Cultural inheritance and innovation	Protect and carry forward the historical and cultural heritage of the city, at the same time promote the innovative development of urban culture, and form a unique urban culture.
4	Social justice and tolerance	Pay attention to the needs of vulnerable groups, create a fair and inclusive urban environment, and promote social harmony and stability.

2.3. The influence and requirements of smart city on urban design

The rise of smart cities poses new challenges to urban design. First of all, smart cities require

urban design to pay more attention to the use of information technology and the layout of intelligent facilities to meet the construction needs of smart cities. Secondly, smart cities emphasize data sharing and collaborative work, and require urban design to pay more attention to communication and collaboration among departments in planning and management. Finally, smart cities put forward higher requirements for the refinement, humanization and sustainability of urban design, which requires more efforts in detail handling, humanistic care and ecological protection. The new requirements of smart cities for urban design are mainly reflected in the following aspects in Table 3:

Table 3 New requirements of smart cities for urban design

Serial number	New requirements of smart cities for urban design	Specific description
1	Layout and integration of intelligent facilities	Urban design should fully consider the demand and layout of intelligent facilities in the planning stage, ensure the efficient utilization and interconnection of facilities, and improve the intelligent level of the city.
2	Data sharing and application	Urban design should establish a perfect data sharing mechanism, break the data isolated island, realize data exchange between departments and systems, and provide strong support for the operation and management of smart cities.
3	Cross-departmental collaboration and integration	Urban design should strengthen the communication and cooperation among all departments in planning and management, form a cross-departmental and cross-disciplinary collaborative working mechanism, and realize the optimal allocation and efficient utilization of resources.
4	Refined, humanized and sustainable design concept	Urban design should pay attention to meticulous treatment, humanistic care and humanized design; At the same time, adhering to the concept of sustainable development, protecting the ecological environment and realizing the harmonious development of economy, society and environment.

3. Present situation of urban design professional training

At present, more and more colleges and universities offer urban design majors or related courses, and cultivate a large number of urban design talents. However, compared with the rapid development of smart city construction, there are still some gaps and deficiencies in urban design education. Specifically, the current situation of urban design education includes the contents in Table 4:

Table 4 Problems in the current situation of urban design education

Serial number	Problems in the current situation of urban design education	Specific description
1	The education system is not perfect	Some colleges and universities lack systematic urban design curriculum system and teaching resources.
2	Teaching methods and means are relatively simple	Lack of innovation and practicality makes it difficult to meet the diverse learning needs of students.
3	The level of teachers is uneven	Some teachers lack practical experience and interdisciplinary background, which affects the teaching quality.
4	Out of touch with industry demand	Some graduates are difficult to adapt to the actual needs of smart city construction, which leads to employment difficulties.

At present, a prominent problem in the training of urban design professionals is the single professional knowledge structure. At the same time, there is a general problem of insufficient

practical ability training in the training of urban design professionals. Many students lack practical opportunities and experience, which leads them to be at a loss or incompetent in the face of practical projects. In addition, students lack innovative thinking and interdisciplinary knowledge background, so it is difficult to play their due role in the construction of smart cities.

4. Construction of a new training mode for urban design professionals facing smart cities

(1) The goal and orientation of talent training

When building a new talent training mode for urban design majors facing smart cities, we must first make clear the goal and orientation of talent training. This new model aims to cultivate urban design talents with the concept of smart city, who not only have solid professional basic knowledge, but also can deeply understand the development trend and demand of smart city. At the same time, these talents should also have the ability of innovation and interdisciplinary integration, and can flexibly use the knowledge and skills they have learned to solve practical problems in the construction of smart cities.

(2) Curriculum system and teaching content reform

In order to achieve the above-mentioned talent training goals, it is necessary to reform the existing curriculum system and teaching content. First of all, we should optimize the professional curriculum to ensure that students master the basic theories and methods of urban design. Secondly, it is necessary to strengthen the content of relevant courses of smart city, so that students can fully understand the concept, characteristics and development trend of smart city. In addition, interdisciplinary elective courses should be added to encourage students to take other courses related to smart cities to broaden their knowledge and horizons.

(3) Innovation of teaching methods and means

In terms of teaching methods and means, innovation is also needed. First of all, practice-oriented teaching methods such as case teaching and project-based teaching can be implemented, so that students can master knowledge and skills in the process of solving practical problems. Secondly, we should make full use of information technology to assist teaching, such as using multimedia teaching, network teaching and other resources to improve teaching effect and efficiency. In addition, school-enterprise cooperation and practical teaching should be strengthened to provide more practical opportunities and platforms for students.

(4) Teaching staff and the construction of teaching resources

When building a new mode of urban design talents training for smart cities, it is also necessary to pay attention to the construction of teachers and teaching resources. It is necessary to set up an interdisciplinary teaching team to attract teachers with different academic backgrounds to participate in the training of urban design professionals. At the same time, it is necessary to strengthen teacher training and academic exchanges to improve teachers' professional quality and teaching level. In addition, teaching facilities and resource platforms should be improved to provide students with a good learning environment and practical conditions. Through the implementation of these measures, the training quality of urban design professionals facing smart cities can be effectively improved.

5. The implementation strategy of the new training mode for urban design professionals facing smart cities

(1) Policy support and guarantee mechanism

In order to ensure the smooth implementation of the new training mode of urban design professionals facing smart cities, it is necessary to formulate relevant policies and measures first. These policies should include provisions and guidance on the teaching objectives, teaching contents and teaching methods of the new model, so as to provide clear policy guidance for colleges and universities. At the same time, the government should also increase capital investment and resource guarantee to provide necessary financial support for the implementation of the new model. In addition, it is necessary to establish corresponding guarantee mechanisms, such as teaching quality

monitoring mechanism and student evaluation mechanism, to ensure the implementation effect of the new model.

(2) School-enterprise cooperation and the combination of Industry-University-Research

The new training mode of urban design professionals for smart cities emphasizes practicality and application, so it is necessary to expand the field and depth of school-enterprise cooperation. Colleges and universities should actively establish cooperative relations with enterprises, jointly formulate talent training programs, develop curriculum resources, and carry out practical teaching. At the same time, colleges and universities should also establish an integrated platform of Industry-University-Research to promote the organic combination of teaching, scientific research and industry. Through this platform, the latest scientific research achievements can be applied to teaching, and students' innovative ability and interdisciplinary integration ability can be improved. At the same time, students' excellent works and ideas can be transformed into actual products or services, which will promote the construction and development of smart cities.

(3) Quality evaluation and continuous improvement

In order to ensure the quality of the new training mode of urban design professionals facing smart cities, it is necessary to establish a perfect quality evaluation system. The system should include the evaluation of students' learning effect, teachers' teaching quality and the efficiency of teaching resources. Through regular quality evaluation activities, we can find out the problems and shortcomings of the new model in time, and provide the basis for implementing continuous improvement and optimization strategies. In view of the problems reflected in the evaluation results, colleges and universities should take effective measures to improve and optimize. Through the implementation of continuous improvement and optimization strategy, we can constantly improve the teaching content and methods of the new model and improve the quality of personnel training.

6. Conclusions

This study focuses on the new mode of urban design talents training for smart cities, and constructs a new mode from the aspects of talent training objectives and orientation, curriculum system and teaching content reform, teaching methods and means innovation, teaching staff and teaching resources construction, and puts forward corresponding implementation strategies. Through the research, the main conclusions are as follows: firstly, the cultivation of urban design professionals facing smart cities needs to focus on cultivating students' smart city concept, innovation ability and interdisciplinary integration ability; Secondly, it is necessary to optimize the curriculum system and teaching content, and strengthen related courses and interdisciplinary elective courses in smart cities; Thirdly, we should innovate teaching methods and means, carry out practice-oriented teaching methods such as case teaching and project teaching, and make full use of information technology to assist teaching; Finally, it is necessary to strengthen the construction of teaching staff and teaching resources, set up interdisciplinary teaching teams, and improve teaching facilities and resource platforms.

Theoretically, this study puts forward a new mode of urban design professional training for smart cities, which enriches the theoretical system of urban design professional training; In practice, this study provides specific operational guidelines and implementation suggestions for universities and related educational institutions, which is helpful to promote the reform and innovation of urban design professional training.

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