

Discussion on the Teaching Reform of Urban Master Planning Under the Background of Territorial Space Planning

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Abstract: *The advent of the era of territorial space planning poses new challenges to urban planning education. As the core curriculum of urban planning, urban master planning needs to actively respond to the national strategy and local practical needs, and reform the teaching. The article attempts to analyze the core demands of territorial and spatial planning for the teaching of master planning from three aspects: knowledge system, professional skills, and value orientation, and discusses the three aspects of teaching mode, teaching content and teaching methods. In the teaching mode, we should carry out joint teaching within the school, school-enterprise, and school-government to promote the collaborative participation of multiple parties. In the teaching content, we should build a multi-core knowledge and skill system, focusing on the integration and application of knowledge. In the teaching method, we should adopt modular teaching that closely integrates theory courses, design courses, and seminars, and pay attention to the cultivation of thinking ability and tolerance.*

Keywords: *Territorial Space Planning, Master Planning, Teaching Reform*

1. Introduction

In May 2019, the "Several Opinions of the Central Committee of the Communist Party of China and the State Council on Establishing a Territorial and Spatial Planning System and Supervising Its Implementation" was released, stating that "the integration of major functional area planning, land use planning, urban and rural planning and other spatial planning into a unified territorial and spatial planning". The "Opinions" established the overall framework of the spatial planning system and put forward the relevant requirements for "strengthening the construction of relevant disciplines in territorial and spatial planning". The "Land Management Law" revised in September pointed out that "if territorial and spatial plans have been prepared, general plans for land use and urban and rural plans will no longer be prepared." Since then, the Ministry of Natural Resources has successively issued a series of technical guidance documents such as the "Guidelines for the Compilation of Municipal Land and Space Master Plans", "Guidelines for Classification of Land and Sea Use for Land and Space Planning", and "Guidelines for the Evaluation of Resource and Environmental Carrying Capacity and Suitability for Land and Space Development". The preparation of the master planning of territorial space in various regions has also begun. The undergraduate education of urban and rural planning is closely related to project practice. The establishment of the territorial and spatial planning system puts forward new demands on the discipline construction and talent training of urban and rural planning. Urban master planning is one of the core courses of the undergraduate course system of urban and rural planning. It is a comprehensive application of theoretical courses such as urban planning principles, urban economics, urban sociology, urban ecology, urban road and traffic planning, and municipal infrastructure planning. It is highly comprehensive and interdisciplinary. The teaching of urban master planning should actively respond to the orientation of territorial space planning, integrate relevant subject knowledge and new technology development trends, optimize the knowledge system, improve students' professional skills, and cultivate correct values. It should carry out reforms in terms of teaching mode, teaching content and teaching methods to cultivate professional talents that meet the national orientation and local practical needs.

2. The Core Demands of Territorial and Spatial Planning for the Undergraduate Teaching of Urban Master Planning

2.1. Knowledge System

In the top-level design of the territorial and spatial planning system, the master planning status is very prominent (Table 1), which is the basis for detailed planning and the basis for related special planning. Compared with the previous urban master plan, the land and space master plan is significantly different in the following aspects:

On the other hand, the territorial and spatial master plan is the integration of urban and rural planning, major functional zone planning, land use planning and other related planning, and knowledge of economic, social, and geographical aspects accounts for more. This requires that the master planning teaching should integrate the content of management, sociology, ecology, and resource science related planning, pay attention to the society, pay attention to the countryside, and actively strengthen the knowledge of the land, ecology, and environment.

On the one hand, although the previous urban master plan covered the whole area, the focus was still on construction land, especially the central urban area. The territorial and spatial master plan is an all-round plan for landscapes, forests, fields, lakes and grasses. Natural ecology, agricultural development, land planning and other professional knowledge have become new areas that need to be expanded in general planning teaching.

Table 1: Five-level and three-category territorial space planning system

| Level | Master Planning | Detailed planning | | Sector Planning | |
|----------|--------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | Ministry of Natural Resources | Relevant departments |
| Nation | National Land Planning Outline | / | | Natural reserve, land improvement and ecological restoration | Railways, civil aviation airports, disaster prevention and mitigation, flood prevention, water pollution prevention |
| Province | Provincial (regional) territorial space planning | / | | Wetland protection and restoration, land improvement, protection and utilization of mineral resources | Highway network planning, airports, ports, disaster prevention and mitigation, etc. |
| City | Urban territorial space planning | Regulatory Plans (within the town development boundary) | Village planning (outside the town development boundary) | Protection and restoration of water system, land improvement, basic farmland transformation, town and village layout | Transportation planning such as rail transit, public facilities such as elementary and middle schools, kindergartens, and sector planning for fire protection |
| County | County territorial space planning | | | | |
| Town | Town territorial space planning | Village planning | | Implementation planning such as land improvement planning | |

2.2. Professional Skill

In the previous teaching system of urban master planning, "technical rationality" is distinctive, and the main goal is to prepare "ideal blueprints". As to how these ideal blueprints operate in practice, whether they can be effectively implemented, and what problems will be faced in the implementation, less attention has been paid to teaching.

The territorial and spatial master plan is a system-wide analysis and planning of important basic elements and resources and environment for regional economic and social development. The ultimate

goal is to improve the modernization of the space governance system and governance capabilities. This requires reasonable coordination of space design, resource awareness assessment, and space governance ability training in the overall planning and teaching process. First of all, China is still in the stage of upgrading the level of urbanization. The master plan is essentially a plan for the physical space of various resources. Improving the ability of space design should still be the focus of teaching. Secondly, the master plan is based on the analysis of the carrying capacity of various resource elements and the feasibility and rationality of resource utilization to implement the needs and objectives of urban and rural development. Ecological evaluation, natural resource carrying capacity evaluation, and land development suitability evaluation have become the basic work of the master planning. This requires the introduction of the research content and methods of resource science and environmental science, sorting out the entire element system that affects urban and rural development, establishing the concept of constraints on elements and resources and the environment, and mastering new professional skills such as resource evaluation and ecological evaluation. Finally, the master plan will build a "picture" management platform for planning implementation and management. This needs to increase the teaching and research of planning policy tools, planning implementation system formulation methods and implementation paths that adapt to my country's national conditions, and strengthen the training of implementation and management skills after planning.

2.3. Value Orientation

In the whole process of the rational planning and implementation of the spatial distribution of various social resources in the urban master plan, the basic value orientation is to maintain public interests and take into account the efficiency and equity of urban and rural development. The territorial and spacial master planning is the concrete implementation of the ecological civilization strategy under the coordination of multiple departments, with the premise of protecting the ecological environment and various resources, emphasizing the rational use of limited various resources, and seeking higher-quality urban and rural development. Among them, the protection of the ecological environment is the maintenance of the highest-level public interests based on global thinking. The rational allocation and utilization of various resources is based on the consensus of various resource management departments and various plans after overall coordination. At the same time, it is necessary to strengthen the cultivation of "participatory planning" ability, based on multi-party communication, to prompt planning departments and stakeholders to reach a consensus on planning and construction, and to achieve a balance of multi-party interests on the basis of safeguarding public interests.

3. Thoughts on the Reform of Undergraduate Teaching in Urban Master Planning

3.1. Teaching Mode: Joint Teaching in School, School-Enterprise, and School-Government

3.1.1. Cross-Expanding of the Teacher Team in the School

Due to the breadth and depth of practical needs, the discipline of urban and rural planning has been continuously strengthened, and in-depth development and higher-level interdisciplinary cooperation are also inevitable. It can make full use of the superior teachers of universities to promote the construction of related disciplines with urban and rural planning as the core. Focusing on master planning, design, and management, we should unite teachers of different disciplines, such as management, economics, geography, transportation, and computer, to establish a cross-faculty, research and teaching team led by urban and rural planning. Relying on the team of teachers, gradually advance the research on theories and methods of knowledge spatialization in different professional fields, gradually expand the core theoretical circle of planning, and enrich the knowledge system of spatial planning.

3.1.2. Joint Teaching between Universities and Enterprises

In order to reform teaching and the development of disciplines, it is necessary to discover problems from practice, then solve the problems from practice, return to teaching, and improve teaching reform. The integration of teaching and practical work can effectively solve teaching problems and practical landing problems. The master planning teaching can invite relevant design agencies to participate. Establish a practice base with design agencies to provide students with opportunities for practice, and use real projects as teaching cases. The project leader of the design agency is invited to participate in the image evaluation. They have participated in the whole process of the real project, are familiar with the project, and can provide professional guidance to the students.

3.1.3. Joint Teaching between Universities and Government Departments

To implement the master plan, it is necessary to understand the operational system of the plan and the division of responsibilities of various departments. Colleges can cooperate with the natural resource management department. The management department is asked to explain to students the responsibilities of the department, the planning operation logic and operation process, the departments involved and the possible focal points, so that students can better understand the master plan and cultivate the ability of students to combine theory with practice.

3.2. Teaching Content: Build a Multi-Core Knowledge and Skill System

At present, the preparation of the territorial and spatial master plan is still under exploration. In the process of advancing the development of knowledge in practice, the corresponding master planning teaching should maintain the disciplinary foundation of the layout, continue to develop in practice, develop under constant trial and error and collision, and promote the development of the teaching knowledge system. The teaching content is based on the "Guidelines for the Compilation of City-level Territorial and Spatial Master Plan (Trial)", and the relevant content is organized into different knowledge modules for teaching around the preparation process of the master plan. Each knowledge module not only needs to teach basic principles, but also needs to teach specific practical skills and needs to be practiced in coursework.

The work process for the preparation of the territorial and spatial master plan mainly includes four stages: preliminary preparation, basic work, planning preparation, and results review and reporting.

The preliminary preparation stage includes the establishment of a working mechanism with the local area, the formulation of a work plan, a mobilization meeting, departmental discussions, field investigations, basic data collection, satisfaction surveys, etc.

The basic work stage mainly carries out basic work such as base maps, "double evaluation" and "double evaluation". At the same time, combined with local characteristics, set up special topics that reflect local characteristics, conduct in-depth research, and provide support for the formulation of planning programs.

In the planning preparation stage, on the basis of basic work and the conclusions of thematic research, through relevant analysis and demonstration, technical work on strategic objectives, overall structure, element coordination, and transmission and implementation will be carried out. At this stage, it is necessary to clarify the strategic objectives and overall pattern of the development and protection, make overall plans for three areas and three lines, divide functional areas, propose various special plans, and formulate short-term action plans and guarantee policy mechanisms.

The results review and reporting stage requires completion of the preparation of the results in accordance with the results requirements of the guidelines, organize the technical review according to a certain process, and improve the planning results through multi-level public participation. After the planning results are reviewed by the standing committee of the people's congress at the corresponding level, they shall be submitted to the corresponding approval authority for approval.

The teaching content is divided into 10 modules including basic analysis, development positioning and goals, land and space pattern, resource element protection and utilization, central urban space layout, historical and cultural protection and urban and rural style shaping, support system, comprehensive renovation and ecological restoration, planning implementation, planning transmission. The teaching content, key points and difficulties of each module are shown in Table 2.

Table 2: The teaching content of urban master plan

| | Teaching module | Teaching content | Points and difficulties |
|---|------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| 1 | Basic analysis | Current situation assessment and risk assessment | Conversion of "The Third National Land Survey" and planned use classification |
| | | | Method and content of planning implementation evaluation |
| | | | Disaster risk assessment type, content and requirements |
| | Resource and environment carrying capacity and suitability | The main technical process, basic data, main content and technical methods of double evaluation | |

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|----------------|---------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | evaluation of land and space development | |
| 2 | Development positioning and goals | City development history and macro situation | City nature and development goals |
| | | Development goals | How to determine the planning index system? Which ones are binding? Which ones are expected? |
| | | Development and protection strategies | |
| 3 | Land and space pattern | Regional synergy pattern | How to implement national and provincial regional development strategies? |
| | | Overall pattern of development and protection | How to divide the main function area? |
| | | | How to determine the urban system? |
| | | "Three Zones and Three Lines" delimitation and control | What constitutes the ecological protection red line? How to determine the size of the red line? |
| | | | How to determine the area of permanent basic farmland? Which areas should be classified as permanent basic farmland? |
| Zoning control | How to predict the scale of urban development boundary? | | |
| 4 | Resource element protection and utilization | Optimization and adjustment of land use structure | How to determine the positioning of the dominant function of the planning zone? What types of planning zones are there? |
| | | Protection and Utilization of Cultivated Land Resources | What is the basis for the structural adjustment of territorial space use? |
| | | Economical and intensive use of construction land | Cultivated land retention and land improvement |
| | | Conservation and Utilization of Forest Resources | Analysis of characteristics and changes of construction land, evaluation of saving and collecting profits |
| | | Conservation and Utilization of Mineral Resources | Forest and mountain protection indicators, protection zoning |
| | | Water resources utilization and wetland protection | Development and utilization direction and total amount of mineral resources |
| 5 | Central urban space layout | Optimize urban spatial structure and functional layout | Water resources protection indicators, supply-demand balance plan, protection zoning and control measures |
| | | City functional zone management and control | What are the methods and functions for determining the population size of the central city? |
| | | Housing security and public services | What is the basis for structural adjustment of construction land? |
| | | Blue-green space | How to clarify the layout and standards of the public service facility system by zoning and grading in light of the total and structure of the permanent population? |
| | | City renovation | What are the contents of the "purple line", "blue line", "green line" and "yellow line" of the city, and what are the control requirements? |
| | | Utilization of underground space | How to define the urban renewal unit? What are the use control requirements for the stock of land? |
| | | Smart City | What are the contents of underground space development management and control? |
| 6 | Historical and cultural protection and urban and rural | Protection and inheritance of historical culture | How to control and guide the construction of a slow-moving system? |
| | | Urban and rural features | How to tap local natural and historical and cultural resources? How to delineate various historical and cultural protection lines? |
| | | | The principle of spatial form guidance and management and control of the humanistic pattern of landscapes in the whole region |

| | | | |
|----|-----------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | style shaping | | How to propose special protection, style shaping, and high-level control of spatial form management and control requirements for the classification and division of rural areas? |
| 7 | Support system | Comprehensive transportation planning | The main points of the planning of city comprehensive transportation system |
| | | Municipal infrastructure | How many types of municipal infrastructure are divided into? What should be compiled for each type? |
| | | Security resilience and comprehensive disaster prevention | How should the drainage and waterlogging prevention system be constructed? How to build a community emergency living circle and how to coordinate the needs of epidemic prevention and control? |
| 8 | Comprehensive renovation and ecological restoration | Comprehensive renovation | Remediation potential analysis and zoning |
| | | Ecological restoration | Identification and delimitation of ecological restoration areas |
| 9 | Planning implementation | Recent construction | The content and requirements of the immediate action plan |
| | | Plan implementation measures | Connotation and construction of policy implementation mechanism |
| 10 | Planning Conduction | Conduction to lower-level planning | Index conduction, bottom line conduction, name conduction |
| | | Conduction of relevant special plans | |
| | | Conduction of detailed planning | |

3.3. Teaching Method: Modular Teaching Combining Theory Class, Design Class and Seminar Class, Focusing on the Cultivation of Thinking Ability and Tolerance

Urban master planning courses are basically based on theory courses, seminars and design courses.

The principles of master planning are mainly taught through theoretical courses. In the series of teaching modules, it is necessary to strengthen the alignment and coverage of the learning content of the theory course with the knowledge points required by the design course.

The seminar mainly trains students' ability to discover, analyze, and solve social problems related to spatial planning. In this process, gradually cultivate students' tolerance values for different groups. A combination of intensive knowledge lectures, document interpretation, seminars and exchanges can be used. In the first class, the teacher guides the students to propose topics for discussion. After class, the students will work in groups to make discussion materials of the design plan. In the follow-up courses, students and teachers will participate in the discussion and complete the course study. It mainly cultivates students' problem-oriented, process-oriented, action-oriented and communication and collaboration abilities. In the process of communicating with others, working with a team, listening, persisting or retreating, they learn, experience, and gradually form tolerance and diverse values.

The design class mainly trains students' material space design ability. At present, the learning link of the urban master planning and design course is generally "research-analysis-planning and design-expression". The content and forms of special lectures and seminars, corporate expert lectures, and practical communication experience can be appropriately increased. Among them, the practical experience of contact with the government and enterprises, communication and coordination with multiple parties should be one of the key optimization content.

Technical tools such as analysis and calculation models, methods and software required for master planning should also be integrated into the teaching of city master planning in stages. Through the optimization of the above teaching methods, the design course has not only become the extension and application of the theoretical course, but also a teaching carrier that responds to the practical needs of the market.

4. Conclusions

Whether it is the ever-changing needs of social and economic development, or the arrival of the era of territorial and spatial planning, it is pushing urban and rural planning education into the reform phase. The teaching of master planning should respond to the core demands of knowledge system, professional skills, and value orientation in the territorial spacial master plan, and explore from the perspectives of teaching mode, teaching content, and teaching methods. This article only launched some preliminary thoughts. The theory and practice of the master plan are long-term work. Territorial spacial planning reforms will take some time to summarize practical experience. The construction of the master planning knowledge system also requires more practical foundations. According to the needs of practice, knowledge is developed, and knowledge is gradually precipitated to promote teaching reform. In the current process of practice ahead of the development of knowledge, how to respond to new practical needs in master planning teaching, continuously develop knowledge content in practice, and improve the teaching system are issues that need to be further explored and deepened.

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