

# Exploration and Practice of Situational Experience in Urban Environment Teaching

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## ABSTRACT

Based on the needs of education in the new era, this paper takes the course of urban environmental science as an example, introduces the situational experiential teaching model, reforms the previous teaching mode which was passively accepted by teachers as the leading students, and explores the application of experiential teaching method. This paper puts forward the teaching mode of "teaching of theoretical knowledge → arranging topics → free grouping of students → designing research programs → field research → analysis of research results → group report discussion → summary". And it takes this as the basis to carry on the reform to the curriculum examination method. Through the introduction of experiential teaching model, we could cultivate students' ability and comprehensive quality in an all-round way, and at the same time embody the teaching goal of taking students as the center and take the cultivation of students' ability as the core.

**Keywords:** *Urban environmental science, The situational experiential teaching model, Forestry major, Teaching.*

## 1. INTRODUCTION

Urban environment science was a course for forestry major (urban forestry direction). It was mainly about urban physical environment (including urban geology and geomorphology, urban climate, urban hydrology and water resources), urban biological environment (including urban animals and plants), ecological environmental effects of urban green space and urban environmental pollution [1]. This course used the principles and methods of ecology and environmental science to understand, analyzed and studied urban ecosystem and urban environmental problems, and to clarify the impact of urban development on the environment and the ecological ways to solve these problems. At present, the class mode adopted the mode of "theory course + curriculum practice". The main purpose of the course was to train students to use the relevant theories and methods learned in class to solve urban environmental problems, focusing on the eco-environmental effects of urban green space ecosystem, which was closely related to urban forestry. In October 2020, the CPC Central Committee and the State Council issued the overall Plan for deepening the Reform of Educational Evaluation in the New era, which put forward the idea of "perfecting the system and

mechanism of establishing morality and cultivating people, and reversing the unscientific orientation of educational evaluation". Colleagues in colleges and universities had also done a lot of research on teaching methods, teaching models and the cultivation of students' ability [2-5], and put forward a lot of experience that could be used for reference. Therefore, the teaching of urban environmental science should also comply with the needs of the situation, not only requiring students to master relevant theoretical knowledge, but also pay more attention to the cultivation of students' ability and quality. Taking the teaching reform of urban environmental science as a case, this paper introduced the situational experience teaching model to cultivate students' ability to study independently, find problems, analyze problems and solve problems.

## 2. PRESENT SITUATION AND PROBLEMS OF URBAN ENVIRONMENTAL SCIENCE TEACHING

Urban environmental science was a course that focuses on theory and application, which required students not only to master the basic theories of urban

physical environment and biological environment, but also to have methods to solve the problems of urban ecological environment. At present, the teaching of the course had not achieved the desired results, and there were mainly the following problems:

The course content covered a wide range and was difficult to deepen. The teaching hours of urban environmental science course were 32 hours, but there were many teaching contents involved. It mainly included urban geological geomorphology, urban climatology, urban hydrology, urban animals, botany, ecology and environmental pollution. Due to the limitation of the total duration of the course, it was impossible to explain it in depth and detail, which made it difficult for students to understand.

Traditional teaching methods were mainly passive acceptance by students. Although a variety of teaching methods were recommended in the education sector, in order to ensure the completion of all knowledge points in the teaching process, teachers still mainly used "instillation" teaching methods, supplemented by teaching videos. Although this teaching method ensured the comprehensiveness of teaching content, students' participation was low in the teaching process. Students could only passively accept knowledge, they could not challenge the authority of knowledge. Students could not effectively show their views and solve environmental problems. Therefore, it reduced the students' interest in learning. There was no significant effect on improving students' ability to find, analyze and solve problems and related qualities. The expected teaching effect was not achieved.

In order to better realize the three goals of knowledge, ability and quality training, the teaching mode of situational experience was proposed in the

course of urban environmental science. The teaching mode took ' theoretical knowledge teaching → topic arrangement → free grouping → design research plan → research → analysis → group report discussion → summary ' as the main line of teaching. The teaching mode aimed at arousing students ' enthusiasm and initiative in learning, aiming at cultivating students ' ability to find, analyze and solve problems, and cultivating students ' excellent quality of teamwork. In addition, in the process of group report and student discussion, we could also cultivate students' ability to question and break the situation of students' passive acceptance.

### 3. EXPLORATION AND PRACTICE OF SITUATIONAL EXPERIENCE TEACHING MODEL IN THE TEACHING OF URBAN ENVIRONMENTAL SCIENCE

#### 3.1. Teaching design

The situational experience teaching model was first put forward by Professor David Kolb of Harvard University in 1984. He had divided the learning process into four stages: Concrete Experience, Reflective Observation, Abstract Conceptualization and Active Experimentation [6-7]. This paper would take the chapter of ' urban green space and its ecological and environmental benefits ' as an example to illustrate the application of situational experience teaching mode in the teaching process of urban environmental science. The curriculum design was shown in Fig. 1. It was included: classroom teaching → investigation and experience → classroom presentation and discussion → summary.

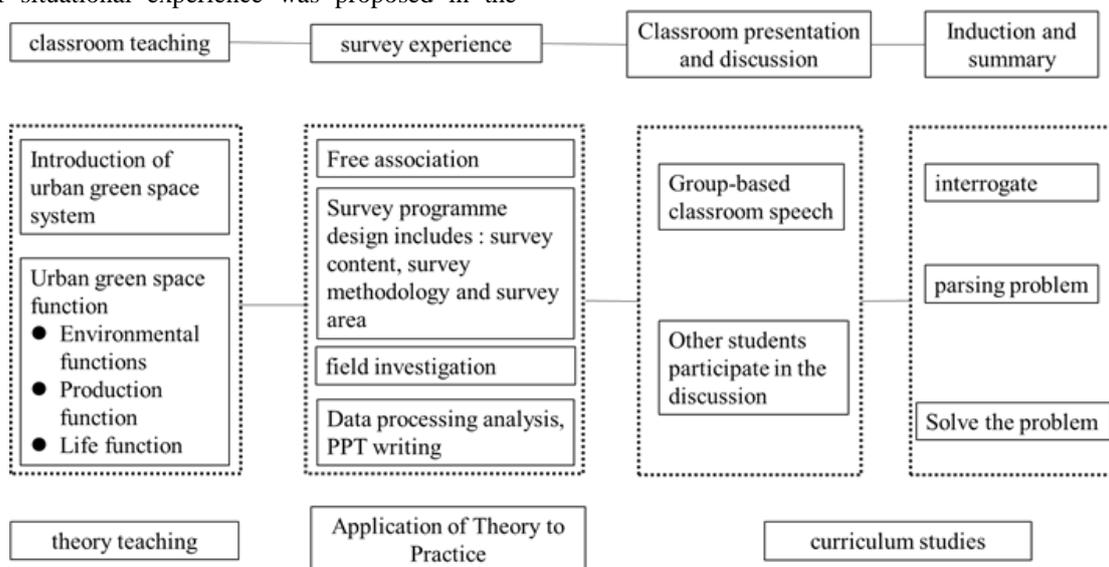


Figure 1 Design of experiential teaching model

### **3.2. Teaching implementation**

#### **3.2.1. Classroom teaching**

Classroom teaching mainly paid attention to the teaching of basic theory. The main contents included: urban green space ecosystem and urban green space function. Firstly, students should understand and master the negative feedback mechanism of maintaining the balance of natural ecosystem. Secondly, students were required to understand and master the role of urban green space in maintaining urban ecosystem balance. Thirdly, students would understand the process and reasons of the transformation of urban green space at home and abroad from ornamental and recreational functions to ecological green space. On this basis, the theory of urban green space function would be taught, including urban green space environment, production and living three functions. Among the three major functions of urban green space, the teaching of environmental function of urban green space was mainly emphasized. It was mainly included about the environmental function of urban green space [1]: purification function, improving microclimate function, noise reduction and safety protection function. Among them, the purification functions of urban green space included: the role of urban green space in purifying the atmosphere, such as fixing carbon and releasing oxygen, absorbing toxic and harmful gases, detaining dust, reducing the content of bacteria in the air, and so on; the role of plant roots in purifying water; the role of plant roots in purifying soil, and so on. The functions of urban green space to improve microclimate included: regulation of atmospheric temperature and humidity, ventilation and windbreak, etc. In the process of classroom teaching, scientific research results and specific cases were used to explain the function of urban green space, so as to improve students' interest in learning and broaden their knowledge.

#### **3.2.2. Survey experience**

In the investigation stage, in order to cultivate students' autonomous learning ability and practical ability, combined with classroom theory learning content, three stages of experience content were designed. The first stage was the topic selection, the second stage was the design and implementation of the survey scheme, and the third stage was the analysis and discussion of the survey results. In order to ensure that students had enough time to read literature, the survey plan was designed and the field survey was carried out. The topic selection and research work reserved sufficient preparation cycle for students, usually for one month. Students were usually scheduled to carry out the survey in the peak vegetation growth period, and the

survey results analysis and discussion stage was usually arranged in the final stage of the course teaching.

In the selection phase. First of all, the survey topics were given by teachers in combination with the theory of classroom teaching. For example, this paper took the function of urban green space as the theme, and students would be required to select topics in groups according to the survey theme. Usually, students were free to group with 2-3 students.

In the design and implementation phase of the survey programme. The teacher would explain the design method of the survey plan in the classroom, and guide the students to do the following work around the topic. For example, first the students would determine the study area, understand and master the problem of green space in the study area. Second, the students would determine the purpose of the survey, design the survey content according to the purpose of the survey, consult the literature to design the survey method, and finally, the students would conduct field surveys. This stage could not only cultivate students' ability to find, analyze and solve problems, but also cultivate students' ability to cooperate with the team, which was one of the main objectives of college students in the new era.

In the stage of result analysis and discussion. This stage mainly would be adopted the teaching mode of combining group report and discussion. The students would report in class in group, and make PPT according to the research results and related literature. In order to improve the participation of other students and enhance the efficiency of classroom discussion, students were required to ask questions about the survey of the report group. The questions could cover the survey content, survey methods and survey results of the report group, and the report group must answer them one by one. This stage of teaching could break the inertia of students' passive acceptance for a long time. Students' questioning spirit was cultivated and their critical thinking ability was improved.

### **3.3. Effect of experiential teaching on assessment methods**

The application of experiential teaching in the course had fundamentally changed the assessment method of urban environmental science course. The course had changed from a single examination-based mode to a comprehensive assessment method combined with various assessment methods, so as to ensure the fairness and impartiality of the assessment results of urban environmental science courses. The comprehensive assessment mode mainly included ordinary assessment, comprehensive investigation assessment and final assessment. The usual assessment

mainly included: the completion of the homework, the feedback of students in the classroom questioning process. The comprehensive assessment of curriculum research mainly included the design of research programs, the writing of research reports, and the reporting of research results. In the process of performance evaluation, the students' mastery of classroom theoretical knowledge, the ability to solve problems and analyze problems in practice, and the team members' cooperation and innovation ability in the research process were comprehensively investigated. The final examination adopted the open-book examination to cover all the objectives of the course.

#### 4. CONCLUSIONS

This paper explores the reform of the teaching mode of urban environmental science by introducing the situational experience teaching mode, and has achieved good results in the cultivation of students' ability and quality. The professional direction of urban forestry is a rapidly developing professional direction of multidisciplinary integration. One of the main goals of talent cultivation is to serve the urban environment and improve the urban environment to make it more suitable for human habitation and life. The course of urban environmental science is a course based on this background. Through the introduction of situational experience teaching mode, students could participate in and perceive the role of green space as one of the main elements of urban environment in maintaining urban ecological balance and solving urban environmental problems in advance. Therefore, the introduction of situational experience teaching mode in urban environmental science curriculum not only embodies the principle of taking students as the center, taking students' ability training as the core and taking professional training objectives as the guidance, but also meets the needs of teaching in the new era.

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