

# A Preliminary Study on the Reform of Flower Science Teaching in Landscape Architecture Specialty

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**Abstract**—Flower Science is a professional basic course of landscape architecture specialty. This paper analyzes the setting and construction of flower science courses in domestic colleges and universities, starting from the main problems in the teaching of flower science in the landscape architecture specialty, puts forward the strategies of optimizing and integrating the teaching content, practical teaching, teaching methods, assessment methods and faculty, and provides suggestions and references for the reform of flower science course in the landscape architecture specialty.

**Keywords**—Landscape architecture specialty; Flower Science; Teaching Reform

## I. INTRODUCTION

In recent years, with the enhancement of people's ecological awareness, garden cities are increasingly respected, and the demand of the society for applied talents in landscape architecture specialty has been increasing rapidly. The training goal of landscape architecture specialty is to enable students to have basic knowledge of landscape plants, ecology, landscape planning and design, as well as basic skills of landscape plant cultivation, maintenance and management, and urban green space planning and design, and to be able to engage in landscape plant cultivation and maintenance and green space planning and design in urban construction, landscape departments and flower enterprises. Landscape plants are one of the essential elements in landscape planning and design, and flowers play an important role. With the ruling concept of "Beautiful China" put forward at the 18th National Congress of the CPC, the flower industry has ushered in unprecedented development opportunities, but it also exposed many problems, such as the lack of professional knowledge of practitioners, poor quality of flower products, and unreasonable landscape configuration [1].

Flower Science is a professional foundation course of landscape architecture specialty of Beijing University of Agriculture. It is the main course in the entire professional knowledge structure. Through the study of the flower science course, students can identify common flowers, skillfully apply them to the landscape layout, master the basic theories and skills of flower production, establish relevant knowledge systems, lay the foundation for learning other professional

courses. It also provides technical talents for the industrialized production, cultivation, maintenance and management of flowers as well as the planting of landscape plants. This course has a strong practicality, application and comprehensiveness, with a wide range of research and tedious knowledge points. In addition, the practical teaching links are not perfect, students' professional skills are weak, and their operating capability is poor. How to guide students to have an interest in flower science and combine theoretical knowledge, new technology and practice is an important subject in the course teaching of Flower Science [2]. In view of the goal of cultivating "applied talents" in our school, combined with the teaching practice of flower science in landscape architecture specialty in recent years, the author analyzes the setting and construction of flower science courses in domestic colleges and universities, and starts from the main problems in the teaching of flower science in the landscape architecture specialty, and puts forward corresponding reform suggestions, to enhance the teaching effect of flower science and to cultivate students' innovative ability and practical application ability.

## II. THE SETTING AND CONSTRUCTION OF FLOWER SCIENCE COURSES IN DOMESTIC COLLEGES AND UNIVERSITIES

"Flower Science" is the main course in the knowledge structure of landscape architecture specialty. Different schools have their own characteristics in terms of course setting and construction. At present, the flower science courses are mainly concentrated in landscape architecture specialty and related majors in agricultural and forestry colleges. There are mainly three textbooks of Flower Science, respectively Garden and Flower Science edited by Yan LIU from Beijing Forestry University, Flower Science edited by the Flower Teaching and Research Group of Beijing Forestry University, and Flower Science edited by Manzhu BAO from Huazhong Agricultural University. Although the editors have a certain tendency in the applied profession, for example, the version edited by Yan LIU is suitable for gardening and landscape architecture specialty, the version edited by Manzhu BAO is suitable for ornamental gardening specialty, but it includes general and monographs in the content of writing. In part, the general includes the classification of flowers, the growth and development of flowers and the environment, the cultivation

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facilities and equipment of flowers, the reproduction and management of flowers, and the control techniques of flowering. The monographs introduce the concepts, types and garden application characteristics, ecological habits and key points of breeding and cultivation of various flowers. Of course, the similarity of textbooks does not mean that the teaching arrangement is consistent. At present, the flower science courses of related majors in undergraduate colleges are concentrated in 32-80. For example, there are 80 hours of flower science course in the landscape architecture specialty of Beijing Forestry University, and 64 hours in Beijing University of Agriculture. To a certain extent, it reflects the differences in the scope of teaching content between different schools.

In the construction of the flower science course, the flower science courses of Beijing Forestry University, Huazhong Agricultural University and Nanjing Forestry University were opened earlier. They have rich experience in curriculum construction and have achieved good results in improving students' practical ability. For example, the national quality course Garden and Flower Science completed by Yan LIU and others attaches great importance to the setting of practical teaching and replaces classroom teaching with actual on-site teaching [3]; Caiyun WANG and other course teams of Huazhong Agricultural University also set the quality course of Flower Science, which explores the "production, study and research" combination teaching mode, integrates teaching with scientific research and production by relying on the teaching base, scientific research unit and practice base, integrates theory with practice, breaks traditional teaching, and improves students' innovative ability and practical ability [4]; According to the teaching experience of the flower science course, Jiangang XU and others from Nanjing Forestry University put forward the reform measures of large class theory teaching and small class practice teaching, and suggested increasing the number of practical hours [5].

### III. MAIN PROBLEMS IN THE TEACHING OF FLOWER SCIENCE IN LANDSCAPE ARCHITECTURE SPECIALTY

#### A. *The textbooks are lagging; the teaching content is not synchronized with the development of the flower industry*

Flowers are closely related to people's lives. With people's higher pursuit of spiritual life, the flower industry is developing rapidly, and the application range of flowers is becoming more and more extensive. New flower types and varieties, new application forms (vertical greening, indoor greening, waterscapes) and new production techniques (plug seedling, soilless cultivation, cut-flower cultivation) continue to emerge. However, the textbooks of flower science are old and updated slowly. Although many textbooks have new versions, the contents are not updated enough. For example, some flowers that were widely used in gardens have been replaced by more and more new flowers, but the textbooks of flower science currently used do not reflect this new knowledge sufficiently, making it difficult for students to keep up with the development of the times and to understand the development of the industry in a timely manner. At the same time, the experimental practice instruction books for flower

science are even less. Although the related textbooks have been published one after another in recent years, the Experimental Course of Garden and Flower Science edited by Yan LIU from Beijing Forestry University is often used. It is not valued, generally only as a reference book for teachers. Some local college teachers even have no reference books. Therefore, how to edit corresponding practical textbooks according to the campus characteristics and local characteristics is the basis for improving students' practical ability.

#### B. *Practical teaching links are weak*

Flower Science is a very practical course. In the process of learning, recognizing flower materials, and mastering the ecological habits of flower materials, breeding and cultivation techniques and garden application forms are practical contents. Obviously, using on-site teaching is more conducive to students' mastery of key points and difficulties, and theory and practice can be linked effectively. However, the author found in the teaching that currently the practical teaching link of the flower science course is relatively weak, mainly as follows: First, there are not enough practical teaching hours. For example, the flower science theory of landscape architecture specialty of Beijing Forestry University is 80 hours, while the internship is only 1 week; The total number of hours of the flower science course in the garden technology specialty of Hebei North University is 90, of which only 20 are experimental hours; The theory course of Flower Science in Beijing University of Agriculture is 52 hours, the experimental class is 12 hours and the internship is 5 days. However, there are a wide variety of flowers and it takes a certain time for flowers to grow and develop. It is impossible to fully grasp the growth and development process of flowers in a limited number of hours. They can only get familiar with the growth characteristics of a certain stage or several stages. Therefore, the multiple practical techniques and application methods that students should master cannot be fully practiced, which weakens the students' practical ability. Second, there is a lack of practical teaching bases. According to the survey, due to limited funds, the construction of practice bases such as nursery, conservatory and greenhouse in some colleges is not complete, and flower resources are relatively scarce and cannot meet the teaching needs. Although some colleges have established links with flower enterprises and research institutes, they have not expanded their practical teaching bases. In addition, some off-campus practice bases have not played the role due to the limitation of traffic and teaching arrangements. Third, there is a shortage of teachers with rich production experience and high practical skills. Due to the improvement of the entrance threshold of college teachers, most teachers are Ph.D., with rich theoretical knowledge, but lack of production experience and with poor practical ability, resulting in serious formalism in practice teaching and poor teaching results.

### *C. Single teaching form and examination form*

Flower Science has relatively few class hours and a large amount of knowledge. Multimedia teaching has become the main form of flower science teaching, and some colleges have also established online learning platforms. Compared with the traditional blackboard writing, multimedia teaching form is intuitive, vivid and informative. However, due to the large amount of information transmitted per unit time, students are often busy taking notes and lack of thinking. The class atmosphere is dull, there is no communication between teachers and students, and students are not highly involved, which leads to the decline of students' ability to analyze problems. Secondly, the multimedia teaching courseware is easy to make some teachers depend on it. They always teach by one set, and their thinking is limited, which leads to poor teaching effect. The assessment method of Flower Science is mainly final exams and usual scores. The final exams account for 60%-70% of the total scores, and the usual scores account for 30%-40% of the total scores. The content of the examination mainly comes from classroom teaching knowledge and textbooks. The assessment target is mainly the students' mastery of theoretical knowledge. Therefore, there are cases that the students can pass the test by reciting before the exam. However, flower science is a practical course. This type of assessment may be biased. It is often the case that the test scores are good, but the practical skills are poor.

### *D. Insufficient faculties*

Today, as more and more schools are positioned as research universities, the tasks of teachers are also more diverse. The number of flower teachers is obviously insufficient, which is worrying, and the faculty in different colleges is uneven. The flower production in the coastal areas is developing rapidly, with strong faculty, many practice bases and rich varieties of flowers. The flower industry in the northeast and northwest regions develops late and the faculty is weak. For example, the number of flower science teachers in Beijing University of Agriculture has increased very limitedly from the first two to the present three, but the number of students required to teach has increased from 70 to 140, and these teachers also undertake other courses. Without a scientific and reasonable teacher-student ratio, improving the quality of teaching can easily become empty talk.

## IV. SUGGESTIONS ON THE TEACHING REFORM OF FLOWER SCIENCE IN LANDSCAPE ARCHITECTURE SPECIALTY

### *A. Select textbooks and optimize the theoretical teaching system*

Textbooks are an important basis for teaching. Good textbooks can stimulate students' interest in learning and are essential for improving the quality of teaching. In the selection of textbook, try to select new national planning materials. At present, Beijing University of Agriculture selects Garden and Flower Science (3rd edition) edited by Yan LIU of Beijing Forestry University as the main textbook. It belongs to the "13th Five-Year Plan" textbook for general higher education of the State Forestry Administration. This textbook is comprehensive, focused, novel in form and easy to understand,

and basically meets the needs of teaching. At the same time, the Flower Science edited by Manzhu BAO from Huazhong Agricultural University is used as a reference textbook.

In view of the characteristics of multiple and miscellaneous knowledge points of the Flower Science course, teachers should first clarify the theme of the course: Flower classification-ecological habits-breeding-cultivation-applications enable students to integrate knowledge points. At the same time, pay attention to highlight the key points and difficulties of the course, coordinate the teaching points between different courses, avoid the repetition of the course content, and fully improve the teaching efficiency. In order to meet the diversified development needs of landscape architecture specialty, in theoretical lecturing of Flower Science, Beijing University of Agriculture moderately adjusted the chapters of Garden and Flower Science edited by Professor Yan LIU, and deleted "Chapter 11 Rock Flowers", "Chapter 15: Carnivorous Plants and Ferns", added "Overview of Germplasm Resources of Chinese Flowers", "Woody Flowers", and also added "Application Forms of Flowers", such as flower beds, flower borders, vertical greening and other application types and design requirements, so that students have a more intuitive understanding of the application of flower landscape. In addition, teachers should also combine the domestic and international flower frontier science and technology dynamics and the development status of the local flower industry to optimize teaching, select the current mainstream varieties of flower production, new varieties and new techniques of flower production. Therefore, the courseware of flower science needs to be constantly updated to bring the latest and most cutting-edge knowledge to students in a timely manner, open up their horizons and improve the teaching effect of the course.

### *B. Strengthen the construction of practical teaching links*

In view of the weak characteristics of the current practice teaching of Flower Science course, the author mainly reforms the practical teaching of flower science from the following four aspects. First, under the premise of constant theoretical time, increase the number of practical teaching hours, increase the theoretical and practical teaching time ratio to 3:1, ensure that students' theory is linked to reality, and master production techniques and skills. Second, try to adjust the teaching content of the practice of flower science and enrich the form of practical teaching. Selectively delete or add some experimental courses, compress verification and demonstration experiments, and increase comprehensive and design experiments, such as adding "flowering regulation technology", "soilless cultivation technology", "flower bed and flower border layout". It can not only improve students' scientific research ability, but also promote teachers to grasp the subject dynamics in time, so as to achieve the effect of teaching and learning. In the past, the experimental course of flower science was completed by the teacher leading the students within the specified time, resulting in some comprehensive experiments cannot be carried out. Therefore, we try to set comprehensive experiments that need a long time as open experiments. For example, 4-6 students form a group and complete the daily cultivation management of flowers in

the campus flower experiment base in spare time, such as sowing, seedling, transplanting, irrigation, fertilization, weeding, shaping and pruning and other practical contents. Teachers provide regular and targeted guidance, which greatly improves students' initiative and autonomy. Third, make full use of the teaching base inside and outside the school and strengthen school-enterprise cooperation. On the one hand, colleges and universities with insufficient practical resources in the school can apply for construction funds through various channels to increase the construction of practice bases within the school; On the other hand, they can establish a long-term and stable practice base relationship with off-campus landscape enterprises and research institutes, and makes full use of off-campus practice bases and research platforms to gradually improve existing teaching resources. Encourage students to do internships in enterprises in their spare time, so as to broaden their horizons, systematically master flower production techniques, and consolidate their professional knowledge. At the same time, encourage students to actively apply for university students' scientific research projects, enhance students' ability of scientific research and exploration, cooperation and innovation, and improve the student's comprehensive quality.

#### *C. Adopt flexible and diverse teaching methods and strengthen practical skills assessment*

According to the "student-centered" teaching philosophy, we should adopt a combination of traditional teaching, multimedia teaching, live demonstration and online classes, abandon the teaching methods of "spoon-feeding" and "cramming education", strengthen the interaction between teachers and students, and adopt heuristic discussion teaching, to improve students' interest in learning and enthusiasm for participation. There are many kinds of flowers, and the cultivation management process is complicated. Through multimedia playback or on-site teaching, students' perceptual knowledge can be enhanced. For some principled content, multimedia teaching can be combined with traditional teaching, which is more helpful for teachers to guide students to think positively, take notes, and consolidate knowledge points after class. In view of the large amount of class notes and the lack of understanding time in multimedia teaching, teachers can upload the courseware, videos of key techniques and related documents to the sharing platform for students to learn and use, and organically combine multimedia teaching and network platform to consolidate the knowledge learned in class. In addition, group discussion can also be used in teaching. The students work in groups, use their spare time to consult the latest materials, and make PPT speeches after analyzing and discussing, which can not only cultivate students' self-learning ability and teamwork spirit, but also exercise students' expressive skills.

The course assessment has a strong guidance to students' direction of learning. Therefore, it is of great significance to strengthen the assessment of practical content and appropriately reduce the assessment of theoretical knowledge. In the assessment process, the final exam score can be reduced to 50%, the experimental score can be set to 35%, and the

usual score 15%, in order to improve students' emphasis on practical teaching and their learning enthusiasm.

#### *D. Establish a reasonable teaching team and attach importance to the cultivation of young teachers*

The teaching of the Flower Science course mainly includes three parts: Theoretical teaching, experimental teaching and practical teaching. Each part of the teaching should be undertaken by different teachers. Teachers of landscape architecture specialty should have distinctive professional expertise, and set up teaching teams according to their own research fields. This optimized teaching team is more targeted in the course teaching process, and more acceptable to students. The professional quality of students can be better improved. Attach importance to the cultivation of young teachers; establish a system of group lesson preparation, lecture trial and lecture attendance. And old teachers should help young teachers one on one. In addition, in order to improve the quality of teaching, teachers must constantly learn and constantly practice to improve their own quality.

### V. CONCLUSION

In view of many practical problems in the course system of Flower Science, this paper proposes a series of teaching reform proposals: making the teaching content keep pace with the needs of the time, strengthening practical teaching to cultivate students' practical ability, stimulating students' enthusiasm for study through diversification of teaching methods, and setting up a reasonable teaching team, so as to make the teaching of flower science more attractive, effectively enhance students' innovative and practical ability, and cultivate the composite application talents for landscaping.

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