A Preliminary Study on Interactive Teaching Model of Botanical Curriculum Group in Local Universities—Taking Jiaying University as an Example

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Keywords: Curriculum group, Botany, Teaching, Interactive model, Local universities.

Abstract. Based on the present situation of botany teaching in local colleges and universities in remote mountainous areas of our country, and combining with the situation of botany opening at home and abroad, this paper analyzes the current research situation of botany teaching in colleges and universities in our country, and puts forward the necessity and basic idea of the reform of botany teaching in the remote local colleges and universities in our country.

Introduction

The 21st century is an era of knowledge economy, scientific and technological progress and social development. In order to adapt to the rapid development of economy and society, we put forward new requirements for personnel training, so we must update the previous teaching concepts and put the reform and development of higher education and teaching in the first place [1]. Interactive teaching is an important embodiment of the democratization of contemporary education in the reform of teaching methods. Interactive teaching means that in a certain teaching situation, the teaching participants follow certain rules as the main body. These rules and regulations are the unity, agreement and universality reached by the two participants through mutual acceptance and recognition, and the material and spiritual exchange and transmission activities in the teaching field. In this process, the transmission includes material and non-material, verbal and non-verbal, understanding and interpretation, comprehension and explanation, and so on. In the course of the interaction, since both parties are aware, the active exchange or the transmitter takes a proactive state to participate in the activity process, thus determining that the interaction is not a one-way feedback process, but rather a two-way dialogue and communication. It requires interactive parties to intervene and immerse themselves in it. It is a living process, not a rigid, lifeless, mandatory process. Compared with the traditional infusion teaching, it is mainly characterized by "communication" and "dialogue" in the teaching process.

In the teaching idea, the traditional teaching emphasizes the students' examination results after teaching, while the interactive teaching focuses on "what has been taught" and "what has been learned" in the teaching process, which is a kind of teaching guiding ideology which advocates the communication between teachers and students. In the teaching method, the traditional teaching is often the teacher's "what I say goes" and the "full-scale irrigation", and the interactive teaching emphasizes the discussion, communication and communication between the teachers and students. In teaching activities, the students change from the role of simple receiver to the main body of learning process, from "want me to learn" to "I want to learn", from receptive learning to discovery learning, inquiry learning, to stimulate students' innovative ideas and desires, to enhance students' interest in innovation, and to cultivate students' innovative ability to produce new understandings, new ideas and innovative things. Interactive teaching is a kind of teaching method that can achieve the collision and blending of different views, stimulate the initiative and exploration of both sides of teaching, and improve the teaching effect in the process of equal communication and discussion.
between both sides of teaching by creating a multilateral interactive teaching environment. This method has clear theme, clear organization and in-depth discussion, which can fully arouse the enthusiasm and creativity of the students. However, the disadvantage is that the organization is difficult and the depth and breadth of the questions raised by the students are uncontrollable.

Current Situation of Botany Teaching in Local Universities

The botanical course group is usually centered on the basic courses of plant morphology and anatomy, plant taxonomy and plant physiology, and integrates other botany related courses and elective courses to gradually form the botanical curriculum group. For different majors, each course in the course group has its own emphasis and cooperates with each other, constantly absorbs the research results of Botany and its branches, enriches the teaching content, reforms the current teaching interaction mode, widens the students' knowledge, and through the reform of the original theoretical course teaching organization form, course teaching content and teaching method and teaching evaluation methods, and then integrate other practical teaching links, explore a new mode of interaction between teaching and learning, update talent training programs, stimulate teachers' teaching enthusiasm, improve their work enthusiasm and creativity, and truly make students' learning change from passive to active, from individual isolated learning to team cooperation learning, from single ability training to comprehensive ability training, and finally form a series of project-based teaching curriculum reform programs and application-oriented undergraduate professional training programs based on project-based teaching. Through the implementation of reform, the efficiency and quality of teaching preparation of relevant courses and majors are significantly improved, the comprehensive quality and innovation ability of students are outstanding, and the employment competitiveness of students has obvious advantages, so as to meet the needs of national and social development. The teaching of local universities should combine with the regional reality and teach students according to their aptitude. The distribution of plants in nature is affected by latitude zonality and has obvious regionality. If teaching in full accordance with the teaching materials, it is bound to lead to the separation of theory and practice. Therefore, according to the different regions of plant distribution, the teaching content should be constantly reformed, the teaching materials should be modified accordingly, the content should be reasonably selected, and the teaching content system with local characteristics should be formed.

The Necessity of Botanical Curriculum Reform in Local Universities

The effective reform of traditional botany teaching is an urgent task for local colleges and universities in remote mountainous areas at present. The practice of all courses in the group of botany courses is very strong, and most of the local universities realize that the cultivated talents must meet the needs of local market, so that the social practice ability of the students are increased. The open experiment and comprehensive experiment were added in the teaching of the curriculum group, the experimental contents were selected, the experiment construction was strengthened, the development of students’ creative thinking was emphasized, and the experimental guidance in line with the regional characteristics was compiled. Based on the advantages of regional plant resources, on the basis of mastering the knowledge of teaching materials, the local plant directory or plant retrieval table is compiled, and the local unique plant species are added, so that students can take local materials in the process of practice and probation.

Teaching Modes and Their Characteristics

Effective interaction is not an activity that is controlled by teachers and has a one-way impact. From the point of view of the information transmission mode of teacher-student interaction, there are three modes:
**Bidirectional Mode**

In this way of interaction, teachers and students send information to each other, receive each other, and feedback each other. In class, it is mainly manifested in the teacher-student dialogue such as teacher-question and student-answer or student-question and teacher-answer and so on.

**Multi-orientational Mode**

This mode of interaction is different from two-way interaction, in addition to the interaction between teachers and students, there is also interaction between students and the two-way flow of information. It emphasizes the multi-directional transmission of feedback of information. The common modes in class are: table discussion, group cooperative learning, group competition, etc. In the process of two-way interaction, by optimizing the way of “teaching interaction ”, that is, by regulating the teacher-student relationship and its interaction, forming a harmonious teacher-student interaction, student-student interaction, learning individual and teaching intermediary interaction, strengthening the interaction between people and environment, in order to produce teaching resonance, we have achieved a teaching structure model to improve the teaching effect (Table 1).

**Reticular mode**

In this interaction, students and teachers form a closely connected network, each student, each teacher is a node of the network. A node can move the whole network, and the radiation range of the interaction is very wide. This interaction emphasizes the equal participation of teachers and students in learning activities, the comprehensive opening of information, and teachers are no longer the only source of learning. The carrier of this interaction is often large mathematical games or online interaction with the help of modern information technology.

| Contrast indicators       | Duck-stuffing teaching                        | Interactive teaching                  |
|---------------------------|-----------------------------------------------|---------------------------------------|
| Communication way         | One-way                                       | Two-way                               |
| Student acceptance        | Passive and negative                          | Active and positive                    |
| Student participation     | Less or no                                    | Rich and diverse                       |
| Classroom climate         | Dull or inactive                              | More active                           |
| Learning interest         | Generally lower                               | Generally higher                       |
| Teacher passion           | Lower                                         | Higher                                |
| Teacher's sense of achievement | Lower                              | Higher                                |
| Teaching effects          | Lower                                         | Higher                                |

**Discussion and Practice of Teaching Interaction Methods**

In teaching practice, we adopt different interactive teaching methods. The interactive teaching methods are varied and have their own characteristics (Table 2). Teachers choose appropriate methods according to the teaching curriculum, teaching content and teaching object characteristics.

| Method                          | Content                         |
|---------------------------------|---------------------------------|
| Class discussion                | One-way                         |
| Course probation                | Passive and negative            |
| Professional practice           | Less or no                      |
| Participating in teachers' scientific research | Dull or inactive |
| Organizing and participating in university students' scientific and technological activities | Generally lower |

**Thematic Exploratory Interaction**

The theme is the "ignition line" of interactive teaching, and the teaching interaction between teachers and students is carried out around a certain theme. The method is generally to put forward the subject
of teaching or curriculum-to analyze the problems in the subject-to think about and discuss the question-to find the answer-to sum up. In order to teach Botany well, we divide the campus into several different regions, and class students into several groups, investigated and counted the plants in different regions, compiled lists of plants in different regions, and required completion at the end of semester. So in the process of compiling this list, they are bound to encounter many problems. What are the plants? How to classify? How to sort? It is difficult for the freshmen to recognize these plants. They naturally turn to teachers and senior students for help. At the beginning, the teachers and seniors just told them about the morphological phenotypic characteristics of some plants, they gradually remember what kind this was and what kind that was. Although these knowledge is fragmentary, they gradually mastered the basic characteristics of morphological structure between different plants, especially the differences between them. After that, they had to sort these plants, and they could learn about different plant classification systems such as Engeler, Hutchinson and kronquist by consulting relevant materials. Through this kind of interaction between teachers and students, we have compiled the list of vascular plants in Meizhou.

**Inductive Problem-based Interaction**

This kind of interaction is to aim at the teaching purpose before class, key and difficult points in teaching and induce the interactive question. At the beginning of the teaching, the teacher throws out ideas or issues to the students, the students think and debate extensively, finally achieve the purpose of understanding and familiarity with what they have learned, at the same time open their thought. For example, in the course of "Plant Landscape" teaching, we asked students, on the basis of on-the-spot investigation of Meizhou Wenhua Park, to write a survey report "the techniques and characteristics of plant landscape in Meizhou Wenhua Park". On the basis of active investigation, the students mentioned the means and methods of plant landscaping in cultural parks and their advantages and disadvantages from different angles of aesthetics, ecology and economics, and launched a heated discussion, which significantly improved the teaching effect.

**Selected Case-based Interaction**

Using multimedia and other techniques to present selected cases, students use their knowledge to try to come up with solutions, correct errors, set suspense, then grasp the key points, hot spots for in-depth analysis, and finally rise to theoretical knowledge. The general program is case interpretation-try to solve-set suspense-theoretical learning-analysis scheme. This method is intuitionistic, concrete, vivid, intertwined, impressive and active. The disadvantage is that theoretical learning is not systematic and profound, the selection of typical cases is difficult, and the classroom knowledge capacity is small. For example, for the planning and design in the landscape, we show the students the characteristics of plant planning and design in Lingnan garden with the case of Dongguan Keyuan. After the field visit, each student is required to write a summary of the characteristics of plant planning and design in Lingnan garden, and two students are selected for PPT demonstration. In addition, the students were divided into four large groups, with about 10 members in each group. The garden plant planning and design were carried out for the wasteland in the east of campus, and each group reported and demonstrated by PPT. The students put forward their own different views on these questions, and the teachers corrected some of the wrong views during the review.

**Multidimensional Speculative Interaction**

In the classroom, the teachers impart the existing conclusion and empirical methods of problem-solving to students, let the students point out the advantages and disadvantages of a certain professional and technical scheme, and then improve it, and the teachers can also intentionally set up positive and negative sides to find the best solution in the debate. The general method is to explain the principle-analyze advantages and disadvantages-develop theory. This method has the advantages of warm classroom atmosphere, deep analysis of problems and great degree of freedom, but the teachers must fully master the basic knowledge and theoretical level of the profession, and have a high ability
to analyze and grasp the new situation, new problems and new ideas. For example, we divide all the students in a class into two large groups, ask each group to write a copy of the campus landscape plants and their advantages and disadvantages of Jiaying University, and then put forward their main viewpoints, especially the transformation scheme on the shortcomings of the current plant allocation. Obviously, the two groups have different opinions, and each group makes a statement and a brief argument on their own views. Through this interactive teaching, not only the students' classroom organization teaching ability has been significantly improved, but also the students' professional level has been significantly improved.

Research Project Participatory Interaction
This is an interaction that involves students in a teacher's research project. In order to be consistent with the goal of cultivating applied talents, the teachers participate in the production line in various forms, and the scientific research team formed on the basis of curriculum group teaching team undertakes a number of production and research projects, which solves the practical problems of production for the enterprises, and gives teachers the opportunity to really go deep into the production line, and also makes the classroom teaching content more substantial and more ground-based. The participation of students undertakes some specific tasks of experiment and investigation, which reduces the workload for teachers, and the teaching is mutually beneficial. The improvement of teachers' practical ability has further promoted the cooperation between schools and enterprises. In recent years, horizontal projects have been carried out better, and students have more opportunities to participate in relevant work, such as Jiaying University-Kelong Plant-cell Engineering Joint Laboratory has a student team from 2013 to 2019. In the Black Tea Project of China Native Livestock Import and Export Corporation, the teachers and students went deep into Anhua Tea Factory to tackle the key problems. During the implementation of the Chinese Herbal Medicine Survey Project and the Forest Pest Survey Project undertaken by members of the course group team since 2016, every holiday the teachers led the students to go deep into the survey of Meizhou, Chaozhou and the surrounding mountainous areas. Students also develop their innovative and hands-on abilities by participating in open projects and training in innovation and entrepreneurship.

Acknowledge
Thank for the financial support of the Guangdong Education Department. This work was supported by Research and Reform Project of Higher Education in Guangdong Province, Promotion Program of Higher Education in Guangdong Province about Key Construction Subjects (Agricultural Resources and Environment) (Guangdong Science and Education Letter [2018]NO.181).

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