

## **On the Reform of the Course System of Agronomy Professional Curriculum Based on Students' Ability**

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**Abstract:** This paper discusses the curriculum system reform of Agronomy Major from the following two aspects, including the relevance between each type of curriculum itself and each type of curriculum. Based on the ability of students, the author puts forward the optimization scheme of the curriculum system structure of Agronomy Major.

Competency based education, or CBE for short, originated in North America and came into being after the Second World War. It emphasizes ability as the basis of teaching, rather than education or academic knowledge system as the basis of teaching. The core of competency based education is to determine the competency objectives based on the needs of the professional posts, decompose them layer by layer according to the needs of the posts, and determines the competencies required to engage in the industry. Clear training objectives, set courses and organize teaching contents with ability as the goal, and finally assess whether students achieve the requirements of the target ability <sup>[1][2]</sup>.

System theory emphasizes the concept of whole. Any system is an organic whole. It is not a mechanical combination or simple addition of all parts. The whole system has new functions and characteristics. That is, the effect of the resultant force is greater than the scattered force <sup>[3]</sup>. Therefore, the construction of a scientific and reasonable curriculum system can integrate resources to a large extent, achieve better teaching results with less investment in teaching, and improve the educational function of the curriculum system. The enhancement of the overall function of the curriculum system requires the optimization of the curriculum system structure. There are two main ways to reform the curriculum system structure, including the improvement of each type of curriculum itself and the enhancement of the correlation between each type of curriculum.

### **1. The self-perfection of all kinds of courses in the course system of Agronomy based on ability standard**

#### **1.1. Reform of theoretical courses**

In the current course system of Agronomy Major, the expression form of theoretical course is mainly subject course, which is conducive to students' learning solid basic knowledge, but the course is often disconnected from the actual application, so the course is difficult to mobilize students' enthusiasm and initiative in learning, and the teaching effect is not satisfactory. Therefore, the reform of the current theoretical curriculum mainly starts from the following aspects.

##### **1.1.1. Integration of curriculum content**

The integration of curriculum content includes the integration of professional knowledge and nonprofessional knowledge, the integration of scientific knowledge and humanistic knowledge, the integration of teacher experience and student experience, the integration of theoretical curriculum and practical curriculum <sup>[4]</sup>. Many practical problems in the current society are open and need to be solved by multi-disciplinary cooperation. In terms of content, the courses in Colleges and universities should permeate each other in the disciplines of literature, science and engineering, set up comprehensive courses and interdisciplinary courses, and effectively cultivate students' ability of comprehensive analysis and problem-solving. How to integrate the curriculum is the direction that

the teaching workers are trying to explore.

### **1.1.2. Reduce theoretical knowledge and increase method content**

UNESCO put forward the slogan of "teaching students to learn" in the report of "learning to survive" published in 1972. At present, teachers mainly teach knowledge in the classroom, but students can't finish all the knowledge of a subject. Teachers must teach knowledge and cultivate students' ability at the same time. Teachers especially need to develop students' Adaptability Based on learning ability and creativity. Therefore, in the teaching process, teachers should reduce the teaching of conclusive knowledge, say less conclusions, ask more questions, teach more methodological content, and actively guide students to think, so that students can master the thinking mode of the subject.

### **1.1.3. Make the course content close to students' actual life**

At present, there is a phenomenon that students study for the sake of learning in schools. Students lack the enthusiasm and initiative in learning. For example, "College English" class, most schools arrange two academic years, many students are to pass the four, six examinations and learn English, after passing often no longer learning English. And the old content of English teaching materials cannot arouse students' interest in learning. We can choose the content that is more contemporary and close to students' real life, such as sports, military, tourism, etc.; we can also choose some practical and professional related content, which are all topics of interest to college students. Choosing these can stimulate students' enthusiasm and enthusiasm for learning and improve their English level. The author also advocates that the two-year English course should be arranged for four years, so that students can continuously learn and truly improve their ability to use English<sup>[5] [6]</sup>.

## **1.2. The reform of experiment course and practice course and the cultivation of innovation spirit**

### **1.2.1. Renew the experiment content and arouse the students' enthusiasm**

Because the experimental content is too old, the connection between experimental content and professional courses is not close enough, the experimental content is difficult to get the recognition of students, and it is difficult to mobilize the enthusiasm of students to participate in the experiment. Therefore, the teaching department should delete and revise the old and unreasonable experimental content in time, increase the new experiment which is suitable for the development of modern agricultural production technology, strengthen the connection with the professional courses, and the experimental content should integrate the modern scientific research results into the teaching effectively, get the recognition of the students, so that the students can actively participate.

### **1.2.2. Adjust the proportion of verification experiment and inquiry experiment**

Confirmatory experiment is a kind of experiment conducted by students in a standardized experimental framework. Students will not be surprised if there are no special circumstances such as operational errors. Therefore, the experimental reports written by students are very similar, and the enthusiasm of students to do experiments is not high, which is not conducive to the cultivation of students' innovation ability and awareness. Therefore, schools should increase exploratory experiments, let students design their own experimental programs, draw conclusions, and let teachers focus on the analysis and selection of good programs. Such experiments are conducive to the cultivation of students' innovative spirit and practical ability<sup>[7]</sup>.

### **1.2.3. Increase the correlation between experimental courses and cultivate comprehensive ability**

Due to the low connection inertia between the experimental courses of Agronomy, the experimental skills of students are relatively single, and students do not have the ability to comprehensively use the experimental technology. Therefore, the school should increase the opening of comprehensive experiments and cultivate students' comprehensive ability.

#### **1.2.4. Reduce the proportion of cognitive practice and increase the proportion of productive and scientific research practice**

Carry out cognitive practice. For example, let students take part in social practice activities during summer vacation, so as to understand agriculture, rural areas and farmers, so that students can enhance their sense of social responsibility. Productive and scientific research practice pays attention to the cultivation of ability. For example, agricultural students can follow the instructor to complete scientific research tasks from the third grade, so as to stimulate students' interest in scientific research and promote the cultivation of students' comprehensive practical ability and innovation ability<sup>[8]</sup>.

#### **1.2.5. Lack of theoretical guidance in practice, strengthening the compilation of practical course materials**

At present, the practical teaching materials of Agronomy Major mainly include experimental instruction and practice instruction, and there are few special teaching materials. In the construction of practice curriculum, the school must strengthen the research of practice curriculum teaching materials, and compile the teaching materials integrating teaching, learning and practice. The teaching materials should be both theoretical and operational. Only when theory and practice are closely combined and work together, can students' theoretical knowledge and practical ability be developed harmoniously.

### **2. The optimization of the relationship among all kinds of courses in the course system of "ability standard" of Agronomy**

An important principle of "structuralism" is that "relationship is more important than relationship item". Therefore, compared with the improvement of each component of the curriculum system itself, the adjustment of the relationship between each component can better promote the optimization of the curriculum system structure.

#### **2.1. Deal with the relationship between compulsory courses and elective courses**

With the development of the times and the progress of the society, the demands of the society for talents and knowledge are becoming more and more diversified. Due to the different conditions, interests, hobbies and specialties of college students themselves, their demands for knowledge are also diverse. Therefore, the diversification of curriculum shape has become an inevitable trend in the curriculum reform of colleges and universities. On the basis of compulsory courses, the school needs to increase the intensity of elective courses, so that students can make choices according to their own needs and interests, and also meet the needs of personalized development of students, so as to realize individualized teaching.

#### **2.2. Deal with the relationship between theoretical courses and practical courses**

The course of Agronomy has strong practicality and application, but it doesn't mean that it overemphasizes the function of practical course. Because the theory course is the foundation of the practice course, only learning the theory course well can carry on the study of the practice course; on the contrary, the practice course can also help the students to test their own theoretical knowledge learning situation and achieve the optimal learning effect<sup>[9]</sup>. At present, there are too many theoretical courses and few practical courses in most agricultural colleges and universities, which is not conducive to the cultivation of students' practical ability. Therefore, while attaching importance to the theoretical courses, the school should increase the practical courses, so that "both hands should be grasped and both hands should be hard".

#### **2.3. Deal with the relationship between the divided courses and the comprehensive courses**

The division curriculum emphasizes the study of students' basic theories and skills. The comprehensive course breaks the boundary between subjects and cultivates the students' overall knowledge and practical ability. They are relative concepts without obvious boundaries. In the

current curriculum system of Agronomy Major, the branch courses are dominant, while the comprehensive courses are relatively few. Because the most important characteristic of Agronomy is its strong comprehensiveness and practicality, schools should increase the proportion of comprehensive courses, and cultivate students' ability to learn interdisciplinary knowledge and solve practical problems.

#### **2.4. Deal with the relationship between subject curriculum and activity curriculum**

The subject curriculum focuses on the cultivation of basic ability, while the practice curriculum focuses on the cultivation of students' initiative and creativity. Although they have different emphases, their training goals are the same. At present, the education of Agronomy emphasizes subject courses, but neglects activity courses. Specifically, in the training program, there are clear requirements for the subject curriculum, but there is no regulation for the activity curriculum. Therefore, in the course system reform of Agronomy, more activity courses should be added according to students' interests and needs, such as all kinds of special lectures, academic reports, academic salons and special discussions.

### **3. The optimization of the system structure of "ability standard" course in Agronomy**

Based on the above analysis, we try to build a more reasonable framework for the curriculum system of agronomy. The diversity of curriculum combination refers to the different proportion and collocation of various courses in the curriculum system. The diversity of curriculum combination also refers to the different positions in the two dimensions of time and space. Integrate the contents of different disciplines with close internal logic, and integrate the contents of different disciplines with universality, which are divided into several curriculum modules, and provide different courses for students to choose in each module. The main contents are as follows:

Increase the proportion of comprehensive courses. It is mainly to integrate science education and humanities education to cultivate students' ability of comprehensive analysis and problem-solving.

The teaching department should improve the proportion of practical courses and enhance the students' experimental ability, practical ability and innovation. The school should separate the experiment course from the theory course, recombine the experiment course and the practice course according to the content, form a complete experiment and practice course system, and increase the comprehensive, design and innovative experiment course.

Increase the proportion of elective courses and build modular courses. In addition to the necessary courses for students to learn talent training programs, they can choose among the major modules according to their own interests and needs<sup>[10]</sup>. We divide the theoretical course into four modules: public course, basic course, professional course and public optional course. Among them, the public course module includes courses of Marxism Leninism, foreign language, computer, physical education, etc.; the basic course module includes courses of mathematics, chemistry, physics and management; the professional course module includes professional compulsory courses (professional main courses) and professional elective courses (expansion and improvement courses). Public optional course module includes: Natural Science and social science related courses. In the experiment practice course, according to its ability level, it also constructs three modules: basic experiment module, field agronomy cognitive experiment module, professional scientific research training, and production practice and graduation design. The purpose of the basic experiment module course in the laboratory is to cultivate students' basic experimental operation skills; the field agronomy cognitive experiment module course aims to cultivate students' practical ability and professional practice ability; the professional scientific research practice, productive practice and graduation design module aims to improve students' ability of combining theory with practice and innovation.

Strengthen the opening of all kinds of activity courses, build activity course modules, and include them in the compulsory links of the course system, in which students can choose the courses they are interested in.

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