Opinions on the Design of College Mathematics Course from the Perspective of College Students

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Abstract: Education serves the society as well as every educatee. It is the mission of university education to enable educatees to learn their favorite courses and lay a good foundation for their future development according to their own development needs. This paper analyzes the disadvantages of the current design of university courses. Taking the proposal of setting up AB course put forward by the School of Mathematics of Technology and Business University as an example, this paper constructs the design of university courses to be selected from the perspective of college students, so that our education can fully reflect the teaching concept taking students as the subject.

1. Introduction

Whether students can decide "why to learn", "how to learn", "when to learn", "what to learn", "where to learn", "with whom to learn" and other issues on their own [1], has been bothering us. If the educatee can be enrolled in a desirable university, can study his favorite major, and learn his favorite courses here, then his university life will be the best. Course is an important means to achieve the purpose of education and a basic link of education. The construction of course is at the core of higher education. Therefore, the design of university courses does not only concern the personal development of students, but also directly affects the future development of the country and society. However, there are still some deficiencies in the current design of university courses, and the way of course selection cannot be people-oriented. Taking the proposal of setting up AB course put forward by School of Mathematics as an example, this paper constructs the design of university courses to be selected from the perspective of college students, so as to make our education fully reflect the teaching concept taking students as the subject.

2. Design of AB Course Generally Divided by College

Each student is a unique individual, different individuals naturally have different careers and life plans. If colleges and universities consider all students as the same, they can't realize the individual development of students. School of Mathematics and Information Science of Shandong Technology and Business University is taken as an example. The school has Mathematics and Applied Mathematics Major (Mathematics and Applied Mathematics Direction, Mathematical Finance Direction) and Information and Computing Science Major (Information Science Direction, Information Security Direction). Even the same major can be divided into many research directions, and directions of each student are different. Here, we propose a new idea of university courses to be selected - "AB course design".

In the freshman year of university, we should continue to set up basic courses of discipline in addition to general compulsory courses, such as: Mathematical analysis, geometry, advanced algebra, college physics, etc.. The basic course of discipline is the basic course that paves the way for the specialized course. It complements the subsequent specialized courses and lays a solid foundation for the subsequent learning.

In the design of the specialized optional courses for the sophomore year, junior year and senior year of the university, AB course design is adopted. It is no longer compulsory for students to study

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as before, but each course is divided into two parts: Course A and Course B. The teaching purpose of Course A is to let students understand the structure system, practical application and development prospect of the course, and let students know the course at a macro level. Its setup purpose is to let students decide whether to choose to study this course which should not occupy more class hours. The teaching purpose of Course B is to carry out intensive reading and study of the course, so that students who choose the course can study the course in a targeted and in-depth way. Taking microeconomics as an example, the college has previously set up 48 class hours and 3 credits, and now it is divided into Microeconomics Course A and Microeconomics Course B. Microeconomics Course A is set 2 to 4 class hours and 0.25 credits. It mainly explains what microeconomics is, including the equilibrium price theory, consumer behavior theory, producer behavior theory, distribution theory, general equilibrium theory and welfare economics, meaning of market failure and microeconomic policy contained in microeconomics, as well as the application and development of microeconomics in real life and other contents. Through the study of Course A, students can grasp the content of the discipline microeconomics as a whole, and decide whether to choose Course B to study the course. Microeconomics Course B is set 44 class hours and 2.75 credits. On the basis of the popularization of Course A, Course B deeply studies the economic behavior of a single economic unit in society and the theory how to determine the single value of corresponding economic variables, and analyzes the economic behavior of a single economic unit. On this basis, it studies the operation of market mechanism and its allocation of economic resources in modern western economic society, and puts forward the corresponding microeconomic policies to deal with the market problems occurring.

In the design of general optional courses, AB course design is also adopted. Before, students' understanding of optional courses was only limited to appearance, and they may have made a choice only based on their first impression. However, after the real contact and learning, it is found that the learning content is far from what we expected. For this kind of course, it is also divided into Course A and Course B. Course A is conducted by excellent teachers with many years of teaching experience. The course is explained as a whole, so that students can really understand the contents of the course to be learned and what specific aspects the course can be applied in later. This way really gives students the choice of space, so that students will not continue to spend more energy and longer learning time in completing the study because of choosing a course that is not suitable for them. Taking investment project evaluation as an example, the college has previously set up the course with 48 class hours and 3 credits, and now it is divided into Investment Project Evaluation Course A and Investment Project Evaluation Course B. Investment Project Evaluation Course A is set 2 to 4 class hours and 0.25 credits. The main contents covered in investment project evaluation are project feasibility study and the principle, content and method of project evaluation. It helps students analyze the investment environment and evaluate the investment project, etc.. Investment Project Evaluation Course B is set 40 class hours and 2.75 credits, which specifically describes the relationship between investment and project, project classification, project management procedures, project evaluation contents and procedures, as well as the basic principles to be followed when carrying out project evaluation, so that students can truly understand how to evaluate investment projects through the learning of this course.

3. Design of AB Course Divided by Module

For the freshmen who just enter the universities, they may still be confused about their future professional development direction. At this time, our school are required to be able to guide the students. School of Mathematics can adopt a new way of thinking for the course design of its students, "optional course modularization" [4], that is to divide the modules to design university courses. School of Mathematics can extend with its own major, and even break through the content of this major to design courses. At the end of the freshmen year of the university, it is divided into several major directions for students to choose. However, this choice must be based on a certain understanding. We should set 4 class hours for overview of course in each module so that students can make their first choice according to their own interests and plans. For example, we can divide

the courses of School of Mathematics into four modules: Mathematical module, computer module, statistical module, economic module. The courses are designed according to different modules, and the specialized optional courses in each module are divided into Course A and Course B. The purpose of this measure is not only to allow students to choose their own development direction according to their own interest planning, but also to make more detailed choice - course selection according to their own interest and ability. Different from 1, the class hours and credits of Course A in each major module are increased appropriately. Teachers are not only going to popularize the content and development direction of major courses to students simply, but also let students experience the fun and connotation of the module through more class hours, so that students can make their own choices and make suggestions for the course design of each module.

3.1 Mathematical Module

Students who choose mathematical modules should first complete the required courses of mathematical analysis, advanced algebra, space analytic geometry, ordinary differential equation, abstract algebra, complex function, real variable function, probability theory and mathematical statistics, functional analysis, differential geometry, etc.. After the completion of the required courses, the mathematical module is divided into the directions of basic mathematics, computational mathematics, probability theory and mathematical statistics, applied mathematics, operational research and cybernetics.

For students who choose mathematical module, AB course design can be carried out for the five directions of the module, so that students can choose more precise development direction that conforms to their own interests and abilities. Here, taking applied mathematics as an example:

The applied mathematics is divided into the Applied Mathematics Course A and the Applied Mathematics Course B. Applied Mathematics Course A is set 8 class hours, so that students can understand what the course is about, and that the course has important applications in other mathematics sub-disciplines. Through the study of Course A, students can experience the course content and development direction of Applied Mathematics, and then decide whether they choose to continue to develop in the direction of Applied Mathematics. Applied Mathematics Course B is an intensive study course for the students who choose the direction of Applied Mathematics, which lays a solid foundation for the future postgraduate entrance examination or work in the direction of Applied Mathematics.

3.2 Computer Module

The students who choose computer module should first complete the required courses such as program design basis, discrete structure, data structure, computer composition principle, database system principle, computer network, software engineering, etc.. After completing the required courses, the computer module is divided into computer science and technology direction, computer system structure direction, computer software and theory direction, and computer application technology direction.

For students who choose computer module, AB course design can be carried out in four directions of the module. Here, taking the embedded system as an example:

The embedded system is divided into Embedded System Course A and Embedded System Course B. Embedded System Course A is set 8 class hours, so that students can understand that the course is to design the computer system structure embedded in the controlled devices to achieve specific purposes. Through the study of Course A, students can experience that embedded system is widely used in household, military, industrial and other fields. If they want to continue to develop in the direction of computer system structure, they can continue the intensive study of Course B.

3.3 Statistical Module

Students who choose statistical modules should first complete the required courses of advanced mathematics, microeconomics, macroeconomics, probability theory, mathematical statistics, introduction to statistics, applied regression analysis, multivariate statistical analysis, etc.. After the completion of the required courses, the statistical module is divided into application statistical

direction, economic statistical direction and financial statistical direction.

For students who choose statistical module, AB course design can be carried out in three directions of the module. Here, taking securities investment as an example:

The securities investment is divided into Securities Investment Course A and Securities Investment Course B. Securities Investment Course A is set 8 class hours, so that students can understand that the course is to study how to invest in negotiable securities to obtain income through the study of investment theory, and teach the basic investment theory. Through the study of Course A, if students are interested in the detailed basic theory and practical operation of securities investment, they can choose intensive study of Course B to master more financial knowledge, and then develop in the direction of financial statistics.

3.4 Economic Module

Students who choose economic modules should first complete the required courses of political economy, capital theory, western economics, international economics, monetary banking, finance, history of economic theory, development economics, etc.. After the completion of the required courses, the economic module can be divided into directions of theoretical economics and applied economics.

For students who choose economic module, AB course design can be carried out in two directions of the module. Here, taking industrial economics as an example:

Industrial economics is divided into Industrial Economics Course A and Industrial Economics Course B. Industrial Economics Course A is set 8 class hours, so that students can understand that the course is the discipline for the study of structure of relationship between industries and internal organization structure of industries and other rules, taking industry as the research object, so as to provide economic theoretical basis for the formulation and implementation of industrial policies. Through the study of Course A, students can fully understand the content and application fields of industrial economics course. If they decide to choose the direction of industrial economics for their postgraduate entrance examination or employment, they can continue to intensive study of Course B.

4. AB course Design under Credit System

At present, the credit system is implemented in our university, which may cause students to study only Course A in order to complete credits instead of Course B or a small number of contents of Course B. In this way, students can simply understand the overview of the course, but do not master the fine knowledge and ability of specialized optional courses, which also goes against the purpose of designing AB courses. Therefore, we must take measures to put an end to this phenomenon. On the basis of the credit system, it is compulsory to stipulate the number of subjects of Course B should be completed, such as: 12 or 16 subjects must be completed. On the premise that the total credits are completed, the number of completed subjects of Course B must also meet the requirements of the school before graduation. In this way, students can really find their own interests in the design of AB course, so as to achieve their own personalized development and spend their full and meaningful college career.

5. Summary

Under the traditional education concept and system, the personality of college students is greatly suppressed [3]. At present, college students belong to a generation full of personality. The past unchanging course design has become more and more unsuitable for the current higher education. In order to carry out the design of university course with students as the subject, we put forward "AB course design". Among them, it can be divided into two categories. Firstly, the school sets up AB course for specialized optional courses as a whole, so that students can really learn what they want to learn; Secondly, overview course with short class hour is set up for students to understand and select modules, and then determine more refined major direction from the modules they choose

through AB course. Through this measure, we can promote the positive personalized development of college students.

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