

Research on the Reconstruction of Teaching Methods and Contents of Mathematics Major in Colleges and Universities From the Perspective of Problem Driven

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Abstract: Discrete mathematics is the basic course of computer major. Based on the characteristics of discrete mathematics, in order to improve the teaching effect, the first classroom of discrete mathematics is proposed, the application of problem driven teaching method in discrete mathematics education is discussed, and the method of course guidance is elaborated in detail. On the implementation and effect of training students' ability of scientific thinking and creation..

1. Introduction

Discrete mathematics is a comprehensive law to study discrete quantity and its relation. This is the core basic course of computer science and technology. This plays an important theoretical supporting role in the professional curriculum system. The main goal of this course is to train students' abstract thinking ability and strict logical reasoning ability. Because discrete mathematics has many concepts, scattered content, solid theory and high abstraction, it is easy for teachers to take this course as a mathematics course. Because it only guides the definition and theory of the textbook, the course content is dull and abstract, it is difficult to cultivate and maintain the learning desire that does not help the follow-up knowledge description, and it is also difficult to cultivate the ability of students. In order to solve this problem, the author, the interest of the students in the first class, the practical background of the computer field, coupled with the problem-driven method, tried to educate the applicable problem-solving ability, the abstract thinking ability, and trained the modeling.

2. The First Class That Interested in Learning

The first discrete mathematics class is very important. In order to make students like discrete mathematics from the beginning, teachers need to use first class to stimulate students' interest and desire for knowledge. Students not only know the importance of this course, but also have a basic grasp of the basic learning methods[1]. At the same time, they feel that it is a professional theoretical course closely related to practical application.

2.1. Status of Discrete Mathematics Course

The independent variable of the first function can take any value continuously in the interval $[0,1]$. This variable is called a continuous quantity. The independent variables of the second function can only take a limited number of values. This is called a discrete variable[2]. Therefore, the discontinuous variable is a quantity that can take any value in the range. Discrete mathematical state. Discrete mathematics is an important field of modern mathematics. It provides the necessary mathematical basis for the following courses of computer science, such as data structure, operating system, database, compiling principle, network and algorithm design[3]. At the same time of introducing knowledge application, teachers can use corpus to show the relationship between

various knowledge modules of discrete mathematics and other computer courses.

2.2. Characteristics, Learning Methods and Contents of Discrete Mathematics Course

According to the needs of the development of computer science and technology, discrete mathematics course is formed by integrating multiple branches of higher mathematics. Its characteristic is based on the discrete quantity with rich content and wide range. Therefore, there are many concepts, many theorems, many inferences and more abstract contents[4]. However, due to the need to prepare the mathematics required by students' professional knowledge, the research content is relatively basic and not difficult. By explaining the characteristics of the course, the teacher can let students get familiar with the teaching materials, correctly understand the meaning of various concepts and theorems, understand the necessary inference process and other correct learning methods. And, really through a lot of practice to obtain knowledge, learning process, please pay attention to the cultivation of abstract thinking ability. Discrete mathematics course has many contents. In the classroom study, the guidance mathematics logic, the set theory, the graph theory, the algebra system four basic contents. In addition, according to the training requirements of computer science and technology, this paper introduces mathematical logic, set theory and chart theory. The future algorithm analysis and design teachers also need to recommend some reference books to this part of students, so that students can take the initiative to learn[5]. After screening, I recommend "discrete mathematics" written by teacher zuaoling and "discrete mathematics" teacher Hu Yang. These two textbooks, classical and rich examples, students can understand and digest more thoroughly.

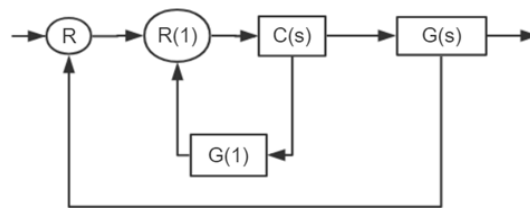


Figure 1 Equivalent feedback control structure of internal model control

2.3. Application Cases of Discrete Mathematics

Einstein once said: interests and hobbies are the biggest motivation[6]. The strong theory and high abstraction of discrete mathematics make many students feel depressed and have no interest in learning. Teachers often encounter several discrete mathematics problems in their daily life, such as the color problem of maps, the square problem of triple magic, etc. they can introduce the Chinese postman problem, the exam schedule, etc., the students' vision, the understanding of discrete mathematics, and the life is closely related to each other in order to understand. Stimulate students' interest and curiosity, and attract students to answer questions actively.

3. Teaching Methods Under the Problem Driven Mode

The purpose of discrete mathematics education is to understand the key points of related knowledge, not only the basis of the post route, but also the ability of thinking and the application of mathematical methods to support students, the innovation of students' learning, and the ability to solve new problems independently[7]. Because of the problems, the teaching method led by professors is adopted. Through the design of problems that can arouse students' interest and hot discussion, analyze problems, guide students to solve problems, explain concepts in the process of solving problems, deepen problems, guide students to solve problems. Draw conclusions, explain and prove theorems by yourself. The process of solving problems is the process of imparting knowledge. In this process, students are the main body and teachers are guides and assistants[8]. After teaching content, teachers need to design a small problem to help students use computer

programming, in order to enhance programming ability and improve programming ability. How to analyze and solve problems, stimulate students' thinking, cultivate students' interest, improve students' learning ability, and lay a solid foundation for further research and teaching.

3.1. Ask Questions to Arouse Students' Interest in Learning

At present, students are lack of initiative in the process of learning, they do not actively find problems, they do not think about problems, they cannot deeply understand and master knowledge, they cannot solve practical problems[9]. The course content is too abstract and boring to improve the concern for learning. Therefore, teachers adopt the guidance method of problem driven mode, aiming at key points, key points and textbook difficulties, and combining with professional characteristics, to design problems of interest from a new point of view. In order to create an active classroom atmosphere, students can quickly input new courses to learn and attract students to explore problems and new knowledge. for example, when explaining the predicate logic, the first story about Socrates' syllogism is that "all people are dead, Socrates is human, so Socrates is going to die.". If you use propositions, what's wrong with this question? How to express this question correctly? In another example, in describing u bridge, it happens to be the same time that you return to the original land. Please guide students to think, discuss and find solutions. In the process of problem driven education, it is necessary for teachers to actively guide students to study and think according to the content of textbooks, students' cognitive rules and professional characteristics.

3.2. Explain Concepts, Deepen Understanding With Mathematical Culture and Examples

In the process of discussion and solution, students are bound to have questions[10]. At this time, the teacher explains the concept. A good explanation of concept is an important step to bring knowledge to students. When explaining mathematics culture and history, we can combine more relevant background knowledge with students' interest and enthusiasm in learning. Then, please explain the process from the abstraction of specific examples to the deduction of mathematical models and mathematical concepts in combination with the set questions. It can not only help students understand the concept, but also improve the ability of abstract thinking. For example, when describing Euler, we should first introduce the life and achievements of mathematician Euler, then abstract the node as a node, set up seven bridges, and form a mathematical model of Seven Bridge problems. This is translated into "Euler problem" and "find a circuit that passes only once on one edge and once with a chart". It is obvious to use this principle to explain the concept of Euler. As another example, in the case of describing the transition closure of relations in set theory, an application example can be given first to determine whether there are two nodes connected in the communication network. Here, the problem of node connection can be divided into two types: direct connection and indirect connection. After abstracting the connection problem of communication network into relation model, finding the indirect connection problem becomes the problem of seeking migration closure. At this point, the concept of transition closure is explained, the convenience of choosing different relations is deepened, and the specific application of transition closure is understood.

3.3. Further Deepen the Discussion and Reach a Conclusion

In the process of education, in addition to imparting knowledge, teachers should pay more attention to the cultivation of students' ability. Before explaining the theorem and proving, students are required to think deeply and develop the ability to discover and explore problems by asking questions step by step. For example, after telling the concept of Euler, you can ask how to modify the model to find the Euler circuit. Then, it gives several examples of undirected graph and directed graph, and entrusts students to find the Euler graph between them, and asks what these Euler graphs generally have. In the process of discussion, teachers adopt a positive attitude, inspiration and motivation recruitment method, encourage students to make bold attempts, and in the class, discuss from various angles, so as to cultivate the necessity of students' divergent and inductive thinking . After a complete discussion, the students come to a conclusion by themselves, and the teacher can guide the students to sum up, abstract the essence of the problem, solve and prove it. For example,

if it is an Euler circuit, all vertices must have one end as the inflow end, and the other end as the outflow end must have a non repetitive edge. Therefore, the strict mathematical description is abstracted as DEG (V). That is, the node degrees must be even. Through this process, students not only learn knowledge, but also have the ability of abstract analysis and problem-solving.

3.4. Apply Theory to Practice

All courses of engineering major should be the center of improving students' practical ability. The author has made a useful exploration in this field. Through the experiment, students need to install the relevant operation and algorithm procedures. In this process, students can have a deep understanding and mastery of knowledge, can grasp the program and specific abstract mathematical knowledge, so as to realize the idea that knowledge comes from practice and is applicable to practice. For example, in set theory, students can be programmed to perform related operations on sets and relationships. In addition, in order to improve the effective management of mechanical components and mechanical efficiency and effectiveness, it is included in the scope of evaluation. The final academic year of this course consists of three parts: general level + mechanical level + final academic year. In this way, it is a kind of development aid for students in their usual research of serious and practical habits. For the time being, they can avoid the urge of students to overcome difficulties under the condition of their feet before the examination, and their interest can be changed by proficient knowledge on the stage. In addition, improve the self-confidence of improving students' learning ability and sense of achievement.

4. Conclusion

Discrete mathematics is an important basic course of computer specialty, which has a wide range of applications in the field of computer. Improving the teaching mode and effect is an important aspect of improving the teaching quality of discrete mathematics. Based on the practical background of the computer field, this paper discusses the problem driven discrete mathematics teaching method. Through the practical education test, the teaching method is effective. It mainly keeps students' interest in learning and improves the effect of education. At the same time of mastering knowledge, we should improve learning ability, improve abstract thinking and mathematical model, and solve practical problems.

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