

Application Analysis of Operating System Teaching Based on Case Teaching Method

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ABSTRACT

It is of great significance to improve the quality of computer teaching and the quality of students to instantiate every definition and algorithm that is difficult to understand in the operating system. This kind of instantiation teaching will make students realize the sense of achievement of operating system learning, and help to cultivate students' innovation ability and practical application ability.

KEYWORDS: Example, Operating system, teaching

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1. INTRODUCTION OF PROBLEM

Operating system principle, as an important professional course of computer major, is a course that focuses on the basic principles and concepts of operating system, introduces in detail the concepts, theories, methods, control algorithms and other contents adopted by each management function of operating system in the process of managing the software and hardware resources of the whole computer system. The whole course is abstract in concept, strong in theory and diverse in control algorithm. Although the students have completed the course of C language programming and assembly principle before this, they are basically confused when they first come into contact with the principle of operating system. This is mainly because the operating system itself is a broad and profound course, and our teaching is mainly to teach students about the principles of the operating system, which can be described as a high summary of the core content of the operating system. At first, the student union was full of fantasy and strong interest in a new course, but with the deepening of teaching, students gradually found that the content of the course was very boring, and the teacher was boring. Slowly, they lost interest, and they just had to deal with things in class, and they still couldn't do anything after learning. For such abstract content, the learning effect is not fast, students can't see the results of the program immediately after writing the code, just like learning the language course. Therefore, the learning of the operating system gradually produces the weariness of learning. Because of the feeling that the effect after learning will not appear immediately and the poor attention to the curriculum, the students' learning initiative

cannot be brought into full play, which will dampen the enthusiasm and enthusiasm of the students.^[1] So how to make the boring principle and profound theory interesting and thought-provoking has become the main goal of the reform.

It is of great significance to improve the quality of computer teaching and the quality of students to instantiate every definition and algorithm that is difficult to understand in the operating system. This kind of instantiation teaching will make students realize the sense of achievement of operating system learning, and help to cultivate students' innovation ability and practical application ability.

2. Example Teaching Method

Most of the traditional classroom teaching mode is centered on the teacher's teaching, and students passively accept the transfer of knowledge. Therefore, the initiative and creativity of students are greatly suppressed, which is not conducive to the cultivation of students' self-study ability and innovative spirit. The "instantiation teaching" is to select appropriate examples and use appropriate metaphors to explain the key and difficult content of the course, to concretize the abstract content, to help students understand and grasp, and to extend appropriately, to guide students to further thinking and exploration

The instantiation teaching method originated from the case teaching method of Harvard University. Its meaning is to adopt the teaching mode of "case theory and concept", which is completely opposite to the traditional teaching mode of "concept theory application". This teaching mode starts from

vivid and lively cases, and thoroughly studies the theories and concepts related to cases from top to bottom. It is often attractive and achieves remarkable results. This teaching method has been widely used in the world and achieved good results.

According to the needs of teaching objectives and contents, case teaching method uses examples to organize students to study. The case teaching method makes the abstract knowledge points concrete by putting the knowledge points through the examples, and applies the abstract theory to the analysis and solution of specific problems. It is convenient for students to master the specific meaning and significance of these knowledge points, and helps to stimulate students' interest in learning, enhance students' self-confidence in learning, and cultivate students' creativity and analysis ability Ability to solve problems. The purpose of imparting knowledge and skills is achieved through the explanation of examples, so as to overcome the disadvantages of traditional teaching mode. It can promote students' cognition of knowledge, strengthen their understanding, and strengthen their memory.^[2] In this way, students are easy to have interest in learning, and can also find the satisfaction of learning, and can further explore and stimulate their creative thinking, so as to achieve good teaching results.

3. The Goal of Instantiation Teaching

The teaching content of the course of operating system principles not only contains some boring and difficult terms, such as process, primitive, concurrency, etc., but also contains some principles and algorithms. To understand and master these contents, using the example teaching method can get twice the result with half the effort.

3.1. Deepen the Understanding of Theoretical Knowledge, Cultivate the Attitude and Ability to Solve Problems Independently

Through the example teaching, we should make students pay attention to the mastery of theoretical knowledge when solving a specific problem, and be able to use the knowledge reasonably after finding the problem, and finally find out the method and way to solve the problem.

3.2. Arouse Students' Enthusiasm and Improve Their Interest in Learning

The traditional teaching method adopts the "indoctrination" teaching, which makes the classroom boring. Especially in the face of some abstract and complex concepts, principles and algorithms in the operating system, if the teaching method is not improved, it is difficult for students to really understand the principles and methods of the operating system. Case teaching breaks the traditional mode of "teachers speak, students listen" and enlivens the stiff classroom atmosphere. At the same time, by leading students to complete a specific example together, teachers can enable students to acquire knowledge from the example, which can stimulate their freshness and improve their interest in learning.

3.3. Strengthen the Interactive Teaching Between Teachers and Students, Improve Students' Ability of Division of Labor and Cooperation

Case teaching can help students understand the design process of algorithms and principles in the operating system more thoroughly. In case teaching, group cooperation can be carried out according to the specific situation of students, and new ways such as teacher-student interaction, student student interaction, role exchange between students and

teachers can be interspersed. Under the guidance of teachers, the project team implements a project together, the team members are sincere unity, friendly cooperation, the relationship between teachers and students has changed fundamentally, teachers are the guide, coordinator, in the whole teaching activities, students are in a state of active participation, rather than passive acceptance, and ultimately achieve the ideal teaching effect. In the process of communication with students, teachers should give proper guidance and help, fully grasp the learning situation of students, so as to adjust the difficulty of the content according to the specific situation in the future teaching. In this way, it not only eliminates the sense of distance between teachers and students, but also enhances students' ability of cooperation, so as to improve work efficiency.

3.4. Enhance Students' Practical Ability

Through specific examples to explain the concept of boring theory, make an abstract problem specific and vivid, so that students can not only complete a specific example, but also further inspire students to draw inferences from one instance, let students exercise their thinking ability, and systematize the scattered knowledge through hands-on practice, develop the attitude of inquiry learning methods, and make it more practical Practice ability has risen to a new level.

3.5. It is Helpful to Improve the Professional Level of Teachers

How to choose a good example and use the knowledge learned in the example to solve new problems, this process brings new challenges to teachers. Moreover, case teaching itself is also a form of "learning by doing". It obtains knowledge from experience and activities to enhance talents. In the process of case learning, these knowledge and talents gradually become an important part of students' knowledge and ability structure, and integrate with the original knowledge and ability. Therefore, teachers must bear the brunt of it, learn more, practice more, summarize more and use more. With more things to learn and more problems to solve, our horizons are naturally broadened.

4. The Selection Principle of Examples

Case teaching method is based on examples. Case teaching must establish the guiding ideology of improving teaching quality as the core, strengthening the cultivation of students' innovation ability and practical application ability as the focus, firmly grasp the key factors affecting the quality of classroom teaching, and establish a scientific index system. In the teaching process of case teaching method, the selection of case is very important, and the quality of case will directly affect the teaching effect and students' learning effect. It can be said that a good example and a successful example can make it easier for students to understand knowledge points, and can inspire students to further think, discuss, summarize and draw inferences from one instance. Therefore, teachers must carefully select and make comprehensive experimental examples according to the actual situation of students, which must be consistent with the teaching content to enrich the classroom content.^[3]The selected examples must be representative, vivid and interesting, which can not only make students have strong interest, cultivate students' innovative ability to analyze and solve problems from different angles, but also activate the classroom atmosphere, so as to promote the quality of teaching. In the selection of examples, we should do the following:

4.1. Instance Selection Should be "Precise"

When learning some knowledge points, the selected examples should be close to life, interesting and representative. For example, when explaining the concept of process, in order to better understand that the process is dynamic, we can give students an example of stir frying. The description of the main ingredients, ingredients and stir frying process of a dish in the menu is more static than that of a program. The program is a static description of the dish. If you don't stir fry, you can't see a dish just by looking at the menu. However, according to the description on the menu, you can't see a dish Description: the process of hand frying is just like the process. It is a dynamic concept. Only by hand frying can we make a dish that can be enjoyed by people. This example comes from the daily life of students. After such an example explanation, the concept of process can be easily understood by students, which makes students feel that learning these examples is very useful and can fully mobilize their enthusiasm for learning. So in the selection of examples, we must be precise and accurate, without too much exaggeration.

4.2. The Goal of the Example Should be Clear

Examples should not be too large, according to the teaching requirements given examples, so that students must grasp the knowledge at a glance. In the design process, the overall goal can be further refined into small goals, and then the overall goal can be reflected through case teaching. In the design, the cognitive goal is divided into three levels: understanding, understanding and mastering. Understanding mainly refers to those students who can remember the knowledge and operation methods; understanding refers to that students express the knowledge and operation methods they have learned with their own language or actions; mastery reflects that students can use the knowledge and operation methods they have learned to solve new problems in the new situation, and then draw inferences from one instance.

4.3. The Difficulty of the Example Should be Gradual

The selection of examples should be from shallow to deep, in-depth and step by step. Under the guidance of teachers, students can deepen their understanding of programming ideas and object-oriented programming knowledge in the practice and Inspiration of specific examples, and learn the basic ideas and methods of programming. In the process of learning, students' ability to accept knowledge will be different for various reasons. Therefore, we should take care of most students. At the same time, teachers should "let students move", that is, we should adhere to the principle of "teacher led, student-centered". Examples in the design to take care of the majority of students, from shallow to deep, simplified, step by step to teach.^[4] At the beginning of the course, simple examples can be selected to cater to the psychological characteristics of students' desire for success; with the deepening of the course, the selected examples are gradually complex, and it is better to include new knowledge points and review old knowledge points; at the end of the course, with the accumulation of knowledge, the examples must reflect comprehensiveness, so as to meet the needs of students to master more knowledge.

4.4. Choose Vivid Examples

The choice of examples should be vivid, close to students' life as far as possible, so that students can easily understand, and try to cover all relevant knowledge points, but also cannot blindly pursue large and comprehensive. Otherwise,

students will feel that they need to memorize too many things and their thinking will be confused, which will affect the teaching effect.

5. Explanation of Examples

In the case of teaching at the same time, we cannot ignore the explanation of the theory. There are many concepts and terms involved in the operating system. At the same time, there are many knowledge points which have strong conceptual and logical nature. If these contents are put in the classroom, the effect of single theory is certainly not ideal. Therefore, the explanation of examples is also very important, which can make students more clear about the theoretical knowledge they want to master through the operation of examples. The following three points should be noticed in the explanation of case teaching:

5.1. Based on Specific Examples, Infiltrate the Use of Basic Concepts and Algorithms

If every single concept and algorithm application in accordance with the content of the textbook is put in the front, rather than in the specific examples, it will hit the students' interest in learning. At the same time, it is difficult for students to fully understand the specific application of these concepts and algorithms without any knowledge background. Therefore, in order to let students understand the use of these concepts and algorithms, teaching should take each fresh concrete example as the starting point, infiltrate some relevant concepts and knowledge timely and appropriately in each example, so that students can learn by doing and do in learning, and gradually and naturally experience the flexible use of each command in the example in the process of completing the task.

In the process of teaching, we start with examples and introduce knowledge points through the explanation of the production process of examples, so as to rise to the height of theory. The first thing students see is a vivid case, which will naturally generate interest in learning. On this basis, it leads to the knowledge points involved, so that students can easily master these knowledge. Only by presenting students with a complete knowledge framework through examples can students have a comprehensive grasp of theoretical knowledge and get twice the result with half the effort.

5.2. In the Examples, We Should Pay Attention to the Setting of Problem Situations to Stimulate Students' Learning Initiative

The essence of setting question situation is to encourage students to question, stimulate students' subjectivity, and cultivate students' thinking ability and creative ability. Students' subjectivity is mainly reflected in the process of learning to master the initiative of learning, to be active, conscious and active in learning. Therefore, raising questions in the process of case teaching, focusing on students' attention, promoting students' active thinking and exploration can make students become the main body in the process of learning. For example, when explaining the concept of process, in order to describe the dynamic characteristics of the process, for example, cooking, we put forward such a question: can we see a dish that can be imported just by looking at the menu? Obviously, the student's answer is definitely No. Then, I want to ask another question: how can I get a plate of delicious dishes? There is no doubt that students will get a plate of delicious dishes only after cooking according to the recipe. The answer just reflects the dynamic characteristics of the process.

5.3. Knowledge Points Should be Explained Step by Step

An example often contains multiple knowledge points. If the teacher finishes the whole process of the example, the students can understand it, but they can't remember it. Therefore, it must be explained step by step. The more new knowledge points, the more detailed the steps should be. The teacher should let the students practice one step immediately after each step. After the students finish the practice, the teacher will continue to speak. This way, until the students follow the teacher step by step to complete the whole example. The teacher must pay attention to control the speed when teaching. When talking about some new knowledge points or the students are unfamiliar with the operation, the speed should be slowed down as far as possible. After a period of time, the students have some basic knowledge, and the teaching speed can be a little faster, especially some knowledge points that have been learned can be explained quickly, or even omitted and only talked about new knowledge points, so as to save more time for students to practice.

6. Summary

The fact shows that a course which is abstract and difficult to learn can be interesting, vivid and easy to learn if students can actively participate in, practice and arouse their learning enthusiasm through examples. In this way, students have a sense of achievement, improve their interest in learning; more importantly, cultivate students' ability of self-learning and application of knowledge, strengthen the cultivation of students' innovation ability and practical application ability.

We should teach students not only knowledge, but also the ability to find, think and solve problems. The effectiveness of

classroom teaching examples lies in that they can enlighten students to "master" the knowledge they have learned, and can closely link "teaching" and "learning" in classroom teaching, so that the teacher's "drawing inferences from one instance" and the students' "drawing inferences from one instance" can really be integrated into one "problem". [5] Students can enhance learning motivation in the examples designed by teachers, practice independently, and solve problems independently under the inspiration and guidance of teachers, so as to explore better learning methods.

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