

Research on the Teaching Reform of Operating System Principle for the Purpose of Increasing Interest

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ABSTRACT

Because the principle of operating system involves many concepts and principles, it is difficult for teachers to teach and students to learn under the traditional teaching mode. In order to effectively improve teachers' teaching enthusiasm and increase students' interest in learning, this paper proposes to select appropriate application cases in course teaching, enrich teaching content, take rain classroom as the intelligent teaching platform, and through the implementation of various curriculum reform programs, stimulate students' enthusiasm for learning and desire for knowledge, better guide students to analyze the application of theory from application, and guide students to practice with theoretical knowledge. And then improve the quality of teaching, to provide some reference for promoting the transformation of teaching reform to a deeper level.

Keywords: *operating system, undergraduate, computer major, rain classroom*

1. INTRODUCTION

The principle of operating system is not only the main course of computer major in undergraduate colleges and universities, but also the core link of constructing the architecture of computer professional knowledge. The operating system is the soul and core of the computer system, the first layer extension of the underlying hardware system to the software system, and the butler who realizes the cooperative work of software and hardware, which has a very important position and role. The teaching content of operating system principle course is an indispensable part of the integrated professional knowledge system of computer science and technology, so it is listed as the core professional course of computer science and technology by ACM, IEEE and teaching committee [1]. However, the teaching practice of this course is difficult to be directly linked with the practical application project, so there is a problem of decoupling between theory and practice, and it is difficult for students to deeply understand the concepts and principles of the course, so they can not achieve good teaching results.

The teaching purpose of the operating system principle course is to deeply understand the nature of the operating system, and how to enable students to apply the concepts and principles learned in the operating system principle course to solve practical

problems in practice. It is a problem worth pondering by every teacher in the course of operating system principles. The intelligent technology based on rain classroom can provide convenient analytical conditions for teachers to make full use of the dynamic data of students' learning. Through the use of information-based teaching tools, teachers can obtain accurate learning information and guide teachers to carry out teaching analysis. Formulate teaching strategies, so as to achieve intelligent, accurate and personalized teaching, so that students can obtain a pleasant learning experience to improve their knowledge and ability. The reform of the teaching activity design of the course content of "operating system principles" in application-oriented colleges and universities has achieved satisfactory results through teaching practice, which can provide some reference for promoting the teaching transformation of application-oriented colleges and universities and promoting the transformation of teaching reform to a deeper level.

2. INSTRUCTIONAL DESIGN

In the teaching process to increase interest for the purpose of operating system theory and practical teaching reform, the quality of the case directly affects the teaching effect, therefore, the selection and accumulation of cases are very important. Cases

should not only attract students' attention, but also make students understand knowledge and imperceptibly realize the transfer of knowledge[2]. In order to improve students' interest in learning, some concepts and principles are applied in various industries in the course of teaching, so as to help students deepen their deep understanding of concepts and principles.

2.1 Case Level Design

The level of the case selected by the teacher should be in line with the students' cognitive law, and the students' fear of difficulties should be eliminated with the cases from shallow to deep. For example, the "producer-consumer" problem is a typical example, which mainly solves the problem of synchronous mutual exclusion between processes. There are many solutions, such as semaphores, locks and so on. Different API functions can be used in implementation. It is abstract to describe the synchronous mutual exclusion problem with the examples of producers and consumers. In different problems, the subjects directly represented by producers and consumers are different. In practice, the "producer-consumer" problem is also a content that needs students to simulate on the computer. If students are not given any transition, they are directly required to use program simulation to realize the "producer-consumer" problem. Students often do not know how to start, so teachers can proceed from practical application, select simple examples, and separate the mutual exclusion problem and synchronization problem between processes. Adopt the method of step-by-step in-depth explanation. For example, mutual exclusion between processes can be illustrated by simulating "car ticketing", as shown in Figure 1. The mutually exclusive access of different threads to the ticket number is realized through the semaphore mechanism or the mutex mechanism. On the basis of understanding the principle of process mutual exclusion, this paper guides the students to complete the concrete realization of the "producer-consumer" problem. In classroom teaching, this step-by-step approach is easily accepted by students, effectively improves students' enthusiasm for learning, makes students get phased results in learning, and satisfies students' sense of achievement in learning.

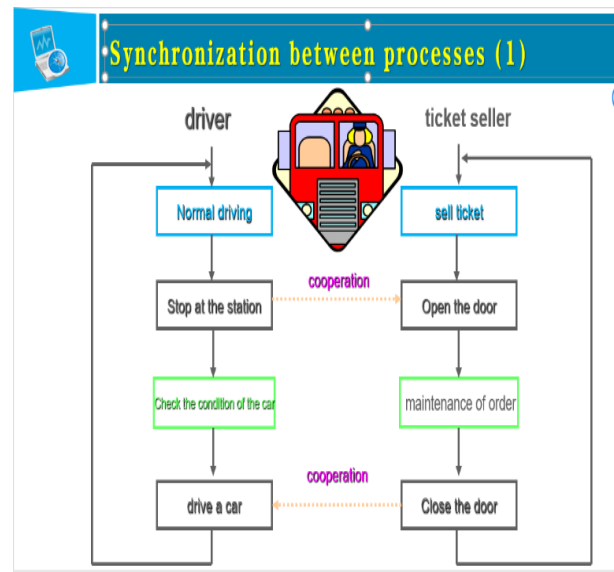


Figure 1. ynchronization between processes

2.2 Case Type Selection

Whether the selection of teaching cases is successful or not, to a certain extent, has a great impact on the teaching effect. For example, the first-come-first-served algorithm is like the checkout process of the supermarket queue, the short job priority algorithm is like some supermarkets will set up a quick checkout channel for a small number of goods, and the high priority algorithm is just like the VIP customers in banking and other industries who specifically set up VIP window services. The high response ratio priority algorithm can be understood to mean that bank users wait in line according to the first-come-first-served algorithm, according to the length of the waiting time. A humanized algorithm that gradually increases the response ratio with a long waiting time. Teaching students the application of algorithms that are closely related to life can effectively improve students' interest in learning and change passive learning into active learning.

3. WISDOM TEACHING DESIGN BASED ON RAIN CLASSROOM

The core of wisdom teaching based on rain classroom can be summarized as "correct the three values and show the three movements". Among them, the three values are the view of teaching purpose aimed at exploring students' wisdom[3], the view of teaching process focusing on effective communication between teachers and students, and the view of teaching evaluation based on the process of students' wisdom generation, while the concept of "three movements" means that the design of classroom wisdom based on

rain is mainly reflected in the vividness of the classroom and arouses learning motivation. Concentrate on three aspects of learning. Rain classroom provides a good wisdom teaching environment for wisdom teaching. Teachers can use the tools of rain classroom to enrich teaching methods, optimize teaching methods, improve classroom efficiency, and control students' learning process of "pre-class-in-class-after-class"[4]. Students can scan the code to check in in class, quiz in class, on-screen comment and so on through smart phones. Rain classroom teaching platform can automatically collect a series of data of students in the learning process, and give a learning report according to the results of data analysis, monitor the learning process, and guide teachers' teaching and students' learning more effectively.

3.1 Classroom Teaching Design Based On Rain

The whole process of teaching includes three links: before class, during class and after class. Before class, during class and after class. Teachers in each link must understand the students' learning situation as soon as possible and design the teaching plan pertinently. The design and organization of teaching should adhere to the educational concept of student-centered, give full play to the main role of learners, inspire learners' wisdom, and meet the needs of learners' pluralistic, personalized and intelligent development[5]. Teachers' systematic design and careful organization of the teaching process is the core of teaching, and teachers' "intelligent teaching" is reflected in the reasonable and proper use of rain classroom design and organization of teaching. Realize the deep interaction between teachers and students, stimulate subjective initiative and enlighten thinking, so as to meet the different learning needs of students, such as autonomous learning, collaborative learning, practical learning and so on.

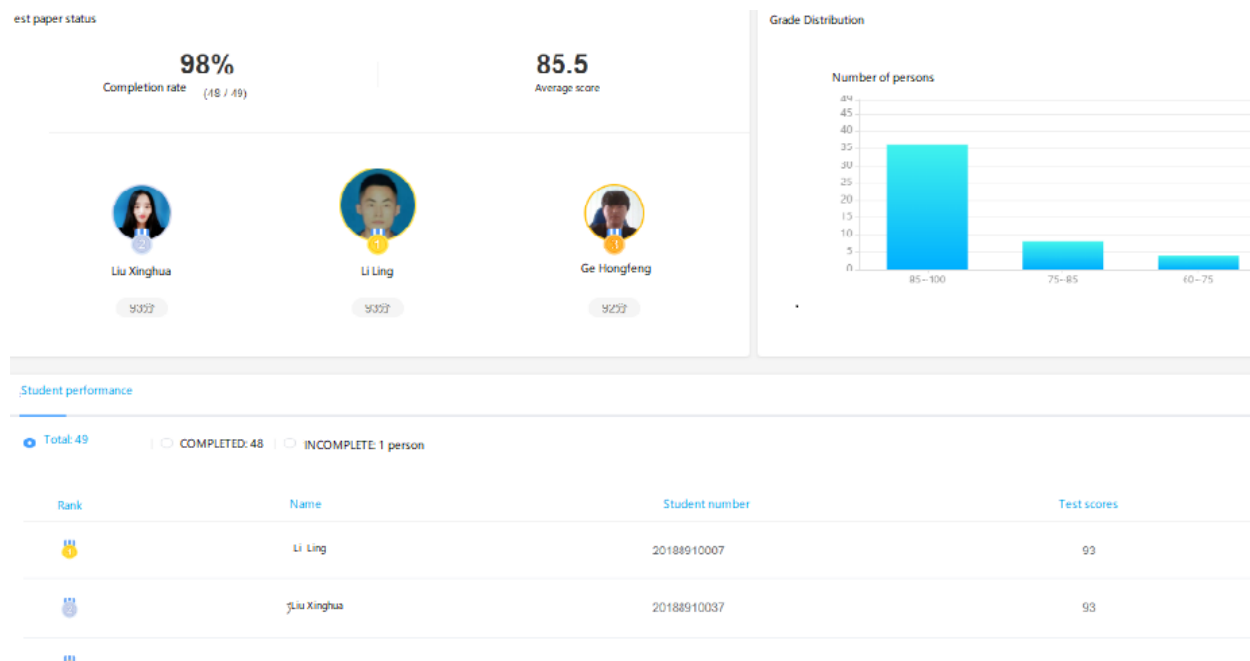


Figure 2. classroom analysis chart of rain on the web page

3.2 Design Of Teaching Activities

1. Before class, the teaching goal must be clear and accurate analysis--the effective design of pre-class teaching activities is the premise of whether the teaching link of wisdom teaching can be carried out effectively. This stage is analyzed from two aspects of teachers and students respectively. First of all, teachers push preview resources to students according to teaching plans and teaching goals, which can be

micro-videos or slides. Students' preview resources are mainly courseware, teaching materials and micro-video. Secondly, the teacher carries on the learning situation analysis according to the student preview situation of the rain classroom feedback, and designs the detailed classroom teaching implementation plan purposefully. Finally, students are required to rain the preview tasks issued in class within a specified period of time, and record the preview process through the rain classroom platform; after the preview is over, complete the preview test within a specified time, with a small number of preview questions, and 2-3

questions are advisable, and get the preview test results immediately.

2. Immersion experience and deep interaction in class-teaching in class through real-time feedback is the concrete implementation of the classroom teaching plan and the core link of teaching. As an effective teaching organization model, BOPPPS(Bridgein, Objective, Pre-sessment, Participatory learning and Post-assessment and Summary) pay attention to interaction and reflection and initiate active thinking[6]. BOPPPS teaching model originated in Canada and is a way for teachers to decompose the curriculum. This model divides the content of a class into six units: curriculum introduction, learning goals, pre-class mapping, learning stages, after-class tests and after-class summary. All the units have the role of connecting the top and the bottom, and they are a whole. This teaching model was initially applied to mathematics teaching design, the purpose is to carry out effective teaching and obtain the best teaching effect. At present, it is widely used in the teaching process of specialized courses which are boring and difficult to understand, and have achieved good

teaching results. Yutang is a powerful tool to promote communication, as shown in Figure 2. The two complement each other. The classroom teaching activities designed by BOPPP run through the rain classroom, which not only strengthens the interactive links and highlights the teaching goals, but also can get feedback in time and improve the classroom efficiency.

3.Class summary and expansion, multiple evaluation-students through after-class review to consolidate the classroom learning content is the summary and extension of classroom learning content, is the consolidation and improvement of classroom learning effect, as shown in Figure 3. According to the statistical data of Yu classroom, teachers know the learning situation of students in real time, and give diversified evaluation and hierarchical tasks, so that students of different types and different levels of needs can find the most suitable extracurricular training content for them, and be able to do it actively and creatively.

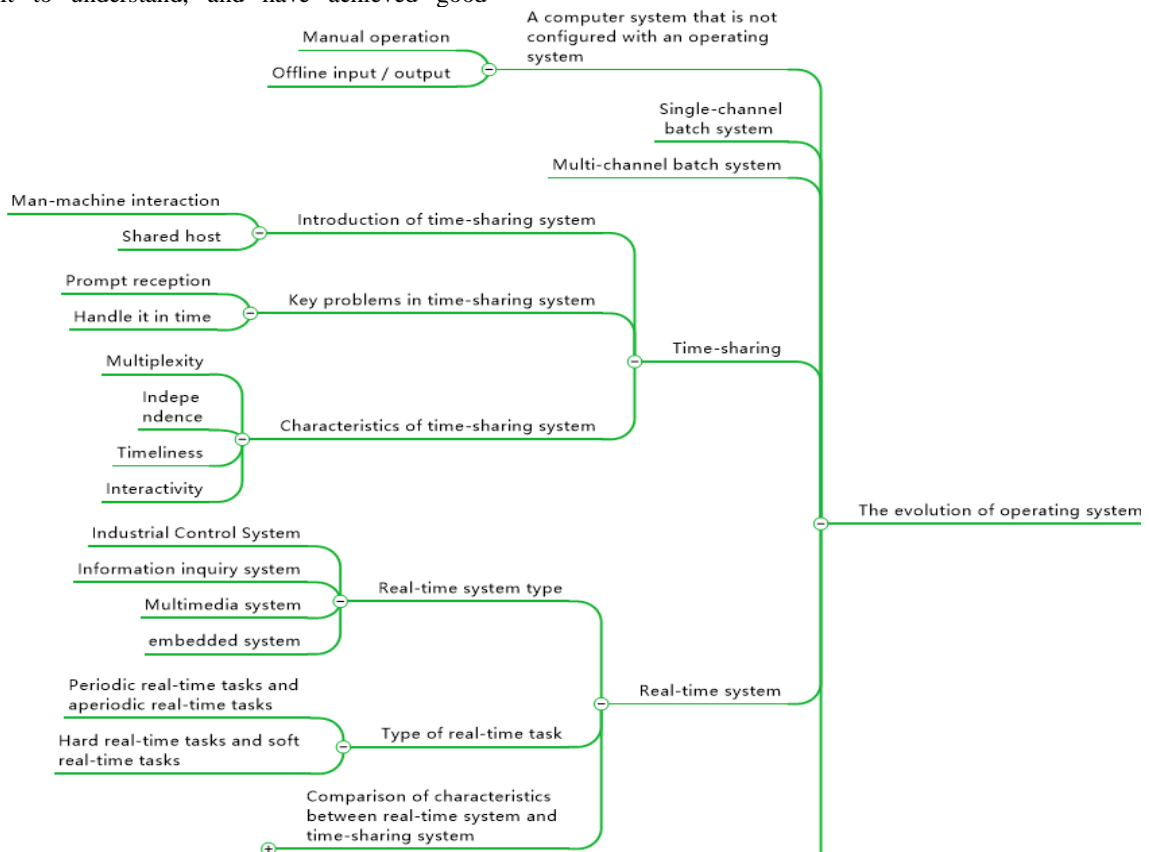


Figure 3. Summary of mind map in chapter 1

3.3 Teaching Evaluation

Through rain classroom teaching,students' interest in answering questions in class has greatly increased,

and the participation rate has reached 100%. Students who answer questions quickly and accurately are rewarded with red envelopes in the classroom, but the reward amount is not high at any time, but the classroom atmosphere is divided into active ones. The

discussion session can actively think and show themselves; in addition, students can take the initiative to preview before class and complete online assignments in time after class. The quality of homework is significantly higher than that of paper homework, and the completion time is faster than that of paper homework. From the point of view of the learning process, due to the accurate positioning of learning problems timely preparation before class, timely participation in class, and efficient evaluation after class, it more effectively promotes students' deep understanding of the course content. In the after-class expansion exercise, 80% of the students can successfully complete the task. With the support of the rain classroom platform, students' learning interest and confidence have been greatly improved. After-class questionnaire survey statistics show that more than 90% of the students like the teaching mode of the course and think that with the help of the rain classroom, I can easily get the resources pushed by teachers, and can establish fast and effective communication with teachers and other students. Tasks that could not be completed independently in the past can now be completed independently. It has greatly enhanced the confidence in learning this course.

4. SUMMARY

The teaching of the principle of operating system should keep pace with the rapid development of computer theory and technology, wisdom teaching cannot do without the support of intelligent teaching environment, and the teaching concept, teaching design and methods of keeping pace with the times are equally important. Only by constantly exploring the teaching models and methods under the concept of wisdom teaching and giving full play to the role of students as the main body in the learning process, can we make the seeds of wisdom go deep into teaching and blossom and bear fruit in the fertile soil of information-based education in the future. After-class diversified evaluation uses electronic files, gauges, visual charts and other methods to carry out process evaluation and summary evaluation, pay more attention to the development and change of students' thinking, and make appropriate evaluation of students' learning situation. And through behavior and psychological measurement of students' physical and mental quality, learning ability of diversified, omnidirectional evaluation, to promote the formation of students' wisdom and ability. The teaching practice shows that teachers should arrange the teaching contents reasonably according to the teaching objects, use appropriate teaching cases to strengthen the relationship between theory and practice, stimulate students' interest in learning, adopt intelligent teaching environment, and change passive learning into active learning. In order to effectively improve the learning

effect and teaching quality. The deep reform in the teaching of the principle of operating system course urges students to change from passive learning to active learning. I hope that on this basis, I can really design a more universal flipped classroom teaching model, build perfect web-based learning resources, and contribute to the training of applied undergraduate talents.

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