

Exploration of Online Teaching Mode of “C Language Programming”

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Abstract: In this paper, through the online teaching of “C Language Programming” course during the covid-19 epidemic, the online teaching mode was explored in many aspects, and the advantages and disadvantages of the online teaching mode were analyzed. Through the comparison of teaching effect, it is concluded that on the basis of fully absorbing classroom teaching experience, the online teaching effect of “C Language Programming” is better than that of traditional classroom teaching.

Keywords: C Language Programming; Online Teaching; Programming

As a public basic course for engineering students in most colleges and universities, “C Language Programming” requires high practical operation, and students generally reflect that it is difficult to learn C Language course. The author has been engaged in C Language teaching for many years, and has tried various teaching methods, but all of them are carried out under the traditional classroom teaching mode. Because novel corona virus came in 2020, we could not carry out traditional classroom teaching, but it also gave us the opportunity to explore the complete online teaching mode.

1. Online teaching process

1.1 Preparation before class

According to the author’s learning experience, in the process of learning C Language, the key is to do more hands-on programming. In the process of programming, a variety of error and repeated mistakes made by students shows that they are into C Language. If the teacher is simply using PPT to demonstrate the ready-made program in class, students only read the program and do not do programming, they may feel that they understand it. Once it comes to practical operation, there are many mistakes. Therefore, teachers and students need to prepare computers, install C Language programming software and teaching platform software Dingding, and be ready for programming during class.

Considering that the Dingding platform mainly completes the teaching task and answers questions for students after class, teachers and students need to join the QQ group of course learning in advance.

1.2 Teaching in class

In the teaching process, for the simple program in the previous chapters, the teacher input the program code and analyze the program for students, and demonstrate how to debug and run the program. Each section of the program gives students their own programming time. Students are encouraged to send screen shots of various errors in programming to the Dingding teaching platform, so that teachers and students can analyze and find out the errors.

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When students start programming, there will be many low-level errors, such as the word “void” written as “viod”, the English small letter “L” written as Arabic number “1”, etc. Students actively look for online program errors, if not found, the teacher will give a prompt. After about 10 class hours of teaching and practice, students have been able to easily find common errors, most of them can independently write about 10 lines of simple C Language program.

There are many question types in C Language textbooks, such as filling in the blank, choice question, giving known conditions, and requiring output results, such as “int a = 10, solving the value of expression $a += 3 + (a \% = 1 + a / 2)$ ”, if you do not use a computer, but use the traditional learning method of manually calculating and then comparing the answers, it is difficult to draw inferences from one instance, and the understanding of the topic is not deep enough. In the process of live teaching, we compile these topics into C Language program, so that students work out the results manually, and then compare with the results of computer program. In order to draw inferences from one instance, it is also very convenient to modify the title in the program, such as changing the operator “+ =” to “- =”, through several training, students’ programming thinking can be cultivated.

Using live programming teaching, it seems that the teaching progress is slower than the PPT teaching, but the actual teaching progress is not slow due to the cancellation of the experimental class hours in the traditional classroom teaching, the teacher’s theoretical teaching and the student’s experiment are carried out simultaneously.

C Language needs a lot of practice, but students are generally afraid of difficulties in practice and are not willing to take the initiative to practice. Through the teacher’s live demonstration teaching, students feel that programming is not very difficult, so they dare to start programming, which is of great benefit to students learning C Language.

1.3 After class guidance

After class, students take the initiative to practice the examples in the textbook. If there is a problem, they are willing to take the initiative to take a screen shot of the problem and send it to the learning QQ group, or directly send the problem to the teacher, in order to can reply to the problem as soon as possible. If there is a representative problem, it will be sent to the learning QQ group for analysis. In this way, the interaction between teachers, students and students is enhanced, forming a virtuous circle of learning.

1.4 The result is given

Under the traditional teaching mode, it is difficult for students to cheat because of the teachers’ on-the-spot supervision, and the examination results can correctly reflect the students’ level. However, in the online teaching mode, no matter how to prevent it, cheating can not be controlled.

How to evaluate students’ performance correctly? The author adopts the following methods: ① Count the students’ online class time after class. ② Count the class activity. Students who often ask questions in the group and actively answer questions will be given a higher usual score. ③ After class, require each student sort out a C Language note according to the teacher’s class content. If the students pay attention to the lecture, the contents expanded and summarized by teacher will appear in the notes many times with a strong personal style. By checking the contents of students’ notes, we can effectively judge whether the students are paying attention to the class. ④ Count the situation of answering questions after class, and the students who often consult the teacher after class are generally active in learning in the class. ⑤ Carefully mark the final examination paper, and if there are similarities, give a low score decisively. In these ways, students’ performance is evaluated as fairly as possible.

2. Advantages of C Language online teaching

2.1 Playback of teaching content

Under the traditional teaching mode, students will miss the teacher’s teaching content if they are distracted in class. In particular, some practical operations of C Language can greatly improve learning efficiency and save learning time if they can closely follow the teacher’s operation. However, in the traditional classroom, students often can’t follow or see clearly the teacher’s practical operation, which causes great trouble to their practice after class. Using online teaching, this problem is

perfectly solved. The Dingding platform can realize the playback of lecture content. Students can download the course video and play the content repeatedly after class. The teacher can also look back at his lecture video and improve it in time. It can be said that the playback of teaching content is the biggest advantage of online teaching.

2.2 Student real time operation

Under the traditional teaching mode, at the beginning of the course, many students actively practice programming after class according to the teacher's requirements, but there are always some program problems. It is difficult to get timely help to solve the problems due to the time after class. This makes students feel that C Language practice is too difficult and programming is too boring, which directly affects their learning enthusiasm. By online teaching, students can follow the teacher's programming closely, and the technical problems can be solved through the teacher's question answering and teacher-student's joint discussion in class. Students have a sense of achievement and feel that programming is not boring, and the learning effect is obviously better than the traditional classroom.

3. Insufficient online teaching of C Language

In classroom learning, the atmosphere is very important. Students with poor self-discipline are influenced by the diligent and studious students around them, and the discipline of the teachers. Passive students will also learn. Online teaching, without the teacher's supervision on the opposite side of the classroom, there is no atmosphere of diligent study. It can be imagined that some students are free to fly while listening to the class at home. Maybe after the students sign in online, they will go to do other things. This requires teachers to pay close attention to students' feedback during and after class, supervise and urge students to complete homework in class, and evaluate students' learning process.

4. Conclusion

The 2-month online teaching of C Language is over. From the initial stage, students have various programming errors, to the gradual reduction of errors, to the final stage of the course, some students have independent programming thinking, and the compiled program is different from the reference program, but still can run perfectly. The final examination results also show that the average score is better than that of the past. About 15% of the students who are very active after class have achieved outstanding results. From the programs they have compiled, we can see that they have the talent of programmers, which is rarely seen in the traditional classroom teaching in the past. Only from the perspective of this online teaching effect, on the basis of fully absorbing the traditional classroom teaching experience, "C Language Programming" course adopts online teaching, which is better than traditional classroom teaching. It is hoped that more online teaching of C Language can be carried out, and continuous progress can be made in practice to improve the teaching effect of C Language.

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