

Exploration of Experimental Teaching Reform Based on Software Testing

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Abstract: As an important part of modern curriculum, experimental course is paid more and more attention. Reasonable experimental projects and efficient classes have played a positive role in promoting students' learning. Experimental course and theoretical course complement each other, and its success is directly related to the final effect of the course. However, traditional experimental classes have low efficiency and poor effect. In order to improve the efficiency of experimental classes, personalized pre-class experimental learning paths will be designed according to students' learning conditions. Subject analysis, case study and division of labor discussion that do not need too much intervention by teachers should be completed before class, so as to realize preliminary demand analysis and make up for gaps in basic knowledge involved in the experiment.

Keywords: *Experimental Reform; Classroom efficiency; Learning path*

I. INTRODUCTION

In addition to theoretical courses, experimental courses are also very important, and their proportion in the curriculum is on the rise^[1]. Experimental class can verify the knowledge learned, expand the scope of knowledge, improve the ability to solve practical problems, is an important means for students to self-test, but also one of the basis for teachers to judge whether students really master knowledge.^[2]

But now part of the experiment is limited by the site, the number of instruments and equipment, in just 2 hours, students often can not complete the topic, experimental plan formulation, group division of labor, specific operation implementation, problem discussion, conclusions and other work. When the teacher is there, many students have not finished the analysis of the topic, so the first half of the experiment class is wasted, and the teacher has no way to give targeted guidance. When the students find many problems, it is time to finish the class. The students who have not finished the experiment have to find another time to finish it in the laboratory, which lengthens the learning process. This loses the main significance of the classroom, does not give full play to the teacher's on-site guidance, and forms the illusion that students have no problems.^[3]

Through experimental reform, the efficiency of experimental class can be further improved, the classroom atmosphere can be active, students can put forward their own questions, teachers can have sufficient time to answer more students' questions, more on-site demonstration and guidance, truly reflect the guiding role of experimental class, so that students can discover and solve problems in experimental class.

Next, through the experiment of software testing course, this paper discusses how to reform the experimental course. The experimental class is the same as the theoretical class, both need to be prepared in advance, and because of the particularity of the experimental class, we need to develop a set of teaching and learning methods separately.

First of all, teachers should distribute all kinds of materials at least four days before class, and give students enough time to prepare and discuss. If too much time is reserved, some students will forget the task or squeeze into the last few days to complete the task. In addition, it is very easy to forget the previewed content, which is not conducive to the absorption of knowledge. If the time reserved is too short, students cannot complete the preview task with quality and quantity.

In the selection of basic knowledge points and cases, and in the production of test questions, we should not only achieve the established effect of pre class preview, but also reduce the burden of teachers and students as much as possible.

II. SELECTION AND TESTING OF KNOWLEDGE POINTS

The core and error prone knowledge points involved in this experiment should be selected as the basic knowledge points. Don't give questions whose difficulty coefficient is higher than the difficulty of theoretical courses, which will increase students' workload and eliminate their enthusiasm for learning. Secondly, it focuses on comprehensive topics. A topic can assess multiple knowledge points, so that students can't complete this topic without understanding the relevant basic knowledge. You can't copy the questions directly from the Internet, so that students can't find the same questions and direct answers, otherwise the preview effect will be greatly reduced. For example, the requirements are listed in the title, and the merging and simplification process of similar rules in Decision table is given. It is required to judge whether it is right or wrong, and whether the given error reason is correct.

The number of questions should be moderate. According to the practical effect, the number of questions should not exceed five. Set 2 points for each question, 8 points in total. The types of questions are mainly multiple-choice questions and judgment questions. These two types of questions can be automatically reviewed in most teaching platforms, which not only reduces the workload of teachers, but also enables students to view the test scores in time. For some complex drawing and design questions, the key steps or error prone points of previous students can be extracted as options for multiple-choice questions. For example, in solving the right triangle problem, it is required to draw Cause-effect graph. You can set "with intermediate results" and "no intermediate results" as two options.

The purpose of preview is to check and make up deficiencies and master relevant knowledge. Therefore, if the teaching platform has the function of repeated submission, you can set all test questions to be submitted twice and get the highest score, that is, you can make a mistake for the first time and do it again after consulting class notes.

III. CASE SELECTION AND TESTING

The reference cases can be taken from the relevant cases mentioned in the theoretical teaching. Modify conditions and

data to form electronic text materials. You can also select relevant cases that are simpler than this experiment. The selection of cases should be diverse, that is, there are basic cases and practical cases. Practical cases mainly choose topics with practical application significance.

The reference case shall list detailed requirements analysis, ideas and steps to solve problems, error prone points, etc. This part of the case must not be complicated. Most beginning students should understand and be able to do it by looking at the steps. Too complex will have a negative effect on preview.

A comprehensive question is enough for the test of the case. The question should be close to the case. If students don't understand the questions thoroughly, they can't understand the test questions or draw correct conclusions. The main types of questions are multiple-choice questions and judgment questions.

For example, it is required to divide effective Equivalence class and invalid Equivalence class according to the recruitment notice, and design Test cases. To meet this requirement, a multiple-choice question can be designed, with the options including age, degree, major and other input conditions, expected output and Test case covering the number of Equivalent class. To meet this requirement, a multiple-choice question can be designed, with the options including age, degree, major and other input conditions, expected output and Test case covering the number of Equivalent class. It is required to select the Test case with reasonable design. If you don't read the case requirements and understand the idea of doing questions, you can't make an accurate choice.

IV. EXPERIMENTAL TASK LIST AND TEAM DIVISION

The experimental task list shall at least include the basic information of the experiment, experimental content, learning path, etc. The basic information of the experiment can include the name, category, class hours, teaching objects, course objectives, requirements, network address of pre class discussion, etc. The learning path should be divided into pre class learning path, in class learning path and after class learning path. The path of each stage is divided into two roles: students and teachers. The student task in the pre class learning path is divided into individual task and group task. Students and teachers complete the tasks in order according to the given path.

The pre class learning path is divided into two types according to the situation of students completing the basic knowledge point test, and one of them is selected according to the situation. The following is a case of learning path.

A. Pre class path 1 - students' personal tasks

1. Complete basic knowledge point test 1-1. If the score is less than 8 points, watch video 1-1, and complete basic knowledge point test 1-1 again until the score is higher than or equal to 8 points.
2. Read and understand reference case 1-1 and complete reference case test questions 1-1. If you have questions about the case or make mistakes in the topic, you can discuss it in the group, or ask the teacher through network teaching platform or QQ and other communication tools until the problem is solved.

B. Pre class path 1 - students' group tasks

Review the questions, discuss the requirements and contents of the experiment within the group, formulate the experimental

scheme, determine the task division, and complete the "specific division" in the "group task division list".

C. Pre class path 2 - students' personal tasks

Complete basic knowledge point test 1-1. If the score is higher than or equal to 8, read and understand reference case 1-1 and complete reference case test question 1-1.

Other parts are the same as Pre class path 1.

D. Pre class path - teacher's task

1. Check the results of basic knowledge point test 1-1. All team members must score 8 or above.
2. If a student fails to complete basic knowledge point test 1-1 and reference case test 1-1 as required before the experimental class, 15% of the experimental score will be deducted.

E. In class path - student's task

1. Put forward relevant questions for pre class tasks and experimental contents.
2. Carry out group discussion as required and complete experiment 1.

F. In class path - teacher's task

1. Observe or listen to students' discussion and guide them to solve problems.
2. Answer and discuss the questions raised by students.

G. After class path learning task

1. After discussion in the experimental class, the relevant problems found are put forward.
2. Submit relevant experimental results.

H. After class path - teacher's task

1. Solve the expansion problems found after the discussion of students' experimental class.
2. Review Experiment 1 according to the scoring standard, and fill in the score of Experiment 1 of each student in the "group task division list".
3. Calculate the experimental score and include the score in the total score of the course according to a certain proportion.

The "group task division list" shall at least include the main work, contribution and signature of each team member. The division of labor needs to be filled in during pre class preview, and the contribution and team member signature need to be filled in after the experiment.

CONCLUSION

The requirements and technologies of software testing experimental projects are relatively complex. In previous experimental courses, it often appears that a course is over, but many students have not fully understood the requirements, or found some knowledge loopholes; If the experimental content is not completed and the discussion is not thorough in class, it is difficult to find a concentrated time for discussion after class. If there is a problem, you can't get the teacher's guidance and answer immediately. In order to solve this problem, a set of personalized experimental course learning path is designed and implemented, and the needs analysis and knowledge point inspection are put before the course. In this way, we can improve the learning efficiency of the experimental class and shorten the time of the experimental project.

References

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