

Research on Learning-centered Curriculum Teaching Model

-- Based on "Java Web Programming"

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Abstract

According to the characteristics of the current private innovative universities, in order to better stimulate the internal driving force of students to learn and implement the student training goals, the teaching concept of taking learning as the center is especially emphasized. This article will combine the characteristics of the "Java Web Programming" course, introduce a learning-centered curriculum teaching concept, and design new teaching models and student assessment standards under the guidance of this concept. Provide reference and new ideas for the reform of programming courses.

Keywords

Learning-centered; Teaching mode; Software engineering; Java web programming; Teaching reform.

1. Introduction

The traditional teaching mode is led by "teaching". Students learn according to the way the teacher explains, and finally the learning effect is tested by written test. At the end of a semester, students often find that they do not have a thorough understanding of the knowledge points they have learned or cannot connect theory with practice because they have not undergone practical operations, which leads to behaviors such as learning weariness and abandonment. The introduction of "learning" as the center of teaching methods, carry out diversified teaching activities such as groups, projects, projects, etc., to promote students' independent learning, and enhance students' self-learning ability and practical ability.

The "learning"-centered teaching model aims at cultivating students' autonomous learning habits to play their subjective initiative. It mainly emphasizes that modern teaching should be transformed from a teaching method centered on the teacher to the teaching centered on the learner. At present, research on constructivist learning theory is generally recognized by educators. Due to the current impact of COVID-19, more and more front-line teachers have introduced online education models into their teaching, forming a hybrid teaching model combining online and offline, and exploring learning-centered teaching practices under the hybrid teaching model. Zhang Haijun [1] took the online course as an example to design the online teaching model, and designed the "learner as the leading position, the key tasks of interactive collaboration, the promotion of the external learning environment, and the integration of effective information resources" for online teaching Model framework; Feng Xiaoyun [2] proposed a teaching model of "one framework, two systems, and three supports" focusing on student learning and development.

2. Learning-centered "Java Web Programming"Section Headings

Take the course "Java Web Programming" of the College of Computer, Guangdong University of Science and Technology as an example to describe the courses related to programming. This course needs to realize the corresponding function by combining the basic code grammar, programming mode and the unique container of Java Web; programming-related courses require students to master how to use the programming language to design and implement functional modules, and need to reflect the right Knowledge application scenarios, practical operation methods and other aspects of learning. Therefore, first of all, we need to carry out teaching, assessment, evaluation and other steps different from conventional courses.

2.1. Teaching

Learning-centered teaching should start from three stages: before class, during class, and after class.

- a) Before class, the teacher publishes the preview tasks and learning materials through the online teaching platform, and informs the students that the teacher will randomly select students to explain their gains in the preview in the first part of the class. Students complete declarative content such as concepts and principles by self-study before class.
- b) During the class, the teacher checks the student's preview situation by organizing student reports, classroom tests, etc., so as to seamlessly connect online learning with classroom teaching. Teachers introduce cases, create learning situations, and elicit new lesson content learning from actual cases. In the classroom, under the guidance and help of the teacher, the students combine cases and knowledge points. The teacher assigns tasks with a certain degree of difficulty to be completed by the students independently or in groups. In this process, students will experience a series of complete practical processes of discussing, analyzing, and solving problems, and try to apply the new lesson content to problem solving. After the task is over, the teacher organizes the students to conduct evaluations within and between groups, and finally conducts teacher evaluation and summary.
- c) After class, the teacher assigns expansion tasks. After class, students use the materials released by the teacher on the teaching platform and the information searched on the Internet to complete the tasks, helping students to consolidate and internalize their knowledge. Through exercises after class, students reflect on and expand their existing knowledge, and the students' comprehensive thinking ability is cultivated.

2.2. Assessment and Evaluation

The assessment and evaluation of programming courses should not be based on paper-based exams. Paper-based exams can only evaluate students' grasp of concepts and principles, and cannot touch the evaluation of procedural knowledge and students' comprehensive quality. Therefore, the evaluation of programming courses should combine process evaluation and result evaluation to achieve compound evaluation. Take student attendance, pre-class preview, task completion and performance in class, completion of homework after class, and phased experiments as the basis for process assessment. In the result assessment, it can be carried out in many forms, such as project completion, defense and display.

2.3. Summary

In learning-centered teaching, the teaching content should be combined with the current cutting-edge technology to integrate online resources. The development of programming technology is changing with each passing day, and every technological update and iteration should be reflected in the teaching content in a timely manner; massive network resources require teachers to screen resources based on content, quality, advancement and other factors, so that students can better accept. Therefore, how to quickly capture the end-point teaching

content and design teaching activities is also a test of the teacher's teaching level. Therefore, teachers need to integrate online resources in multiple dimensions and associative materials, and use them as teaching aids to let students understand the learning of Java Web Programs cannot stop at paper textbooks.

Finally, it needs to be emphasized that the teaching methods for programming courses should be more problem-oriented. After students have learned and trained basic knowledge, they can analyze and decompose the problem model. Students can discuss and cooperate in groups, and implement each module function according to the process steps. This will be more conducive to students in the programming courses in the classroom learning content and practical operations, while improving students' comprehensive ability in problem analysis, problem solving and group cooperation. The assessment method should be changed from a closed-book written test to diversified forms such as project completion, defense and display, comprehensive problem analysis and statement, and the evaluator should also develop from a single teacher evaluation to a combination of student self-evaluation, student mutual evaluation and teacher evaluation. Achieve a diversified evaluation model with diversified evaluation methods and diversified evaluation subjects.

3. Advantage Comparison and Difference Analysis after Introduction

This study expands student performance evaluation from 7 dimensions, namely attendance, preview, interaction, group tasks, chapter tests, homework, and chapter learning times. The weights are set to 20%, 5%, 15%, and 15%, 5%, 20%, 20%, as shown in Table 1. This study designs teaching activities with students as the main body and conducts evaluation from 7 dimensions, with particular emphasis on the completion of grouping tasks, and the form of classroom interaction tends to be more diverse. Students can discuss and explain around a case project. You can analyze a common problem and make a comparative experiment. In this way, students' interest in learning has been greatly improved, enabling students to learn and enjoy themselves.

Table 1. Evaluation dimension and weight setting

Category	Weights	Describe
Attendance	20%	Accumulated by the number of times, +1 for each check-in, the number of check-ins up to 39 times is a full score
Preview	5%	Preparatory tasks are all completed as full marks, if not completed, they will be scored according to the task score
Interaction	15%	Participate in class activities such as voting, questionnaires, rushing answers, selecting candidates, discussions, and in-class exercises to get corresponding scores, and the points can reach 100 points
Group Tasks	15%	The score obtained by the student in each group task activity, with a maximum score of 100
Chapter Tests	5%	Scoring according to the student's test situation
Homework	20%	Grading according to the completion of the student's work
Chapter Learning Times	20%	The number of chapters learning up to 200 times is a perfect score

Through the analysis of students' comprehensive scores, as shown in Figure 1, it can be seen that 43.9% of students' scores are 80-100 points. This shows that the learning centered

teaching reform implemented by this research institute has achieved good results in the mastery of students' knowledge and skills and the cultivation of comprehensive quality.

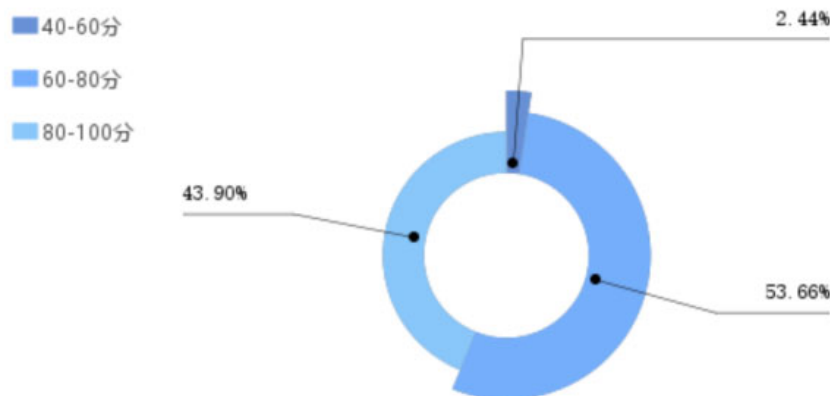


Figure 1. Distribution of students' comprehensive scores

In summary, through the introduction of a learning-centered teaching model, combined with online and offline teaching methods, it can greatly reduce students' dependence on passive learning, and then transform to an active learning method. Teachers can also change their roles, changing the classroom from "teaching-centered" to "learning-centered". According to the course evaluation criteria proposed by Wang Xiaofang et al. [3], this study is evaluated, namely "3 dimensions, 18 elements, 25 exploratory questions", and it can be concluded that: This study has a positive promotion in the three dimensions of enabling students to obtain deep knowledge and develop high-level thinking, create a good learning atmosphere, enhance students' recognition of teaching and stimulate students' learning drive.

4. Conclusion

This research takes the course of "Java Web Programming" as an example, compares the teaching concept of "learning as the center" with traditional teaching, combines the characteristics of Java Web programming and the existing problems in teaching, and designs a learning-centered "Java Web Programming" course teaching mode, and proposed multiple evaluation programs. The teaching practice has proved its feasibility and usefulness.

References

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