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Research on the Reform of Teaching Method and Evaluation System of Data Structures (A) based on Information and Computing Science

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Abstract: Data Structures (A) is a basic course between mathematics, computer software and computer hardware. It is the core course of information and computing science. The data structure course is designed for the Shandong University of Technology to implement the Quality Improvement Project, to build a distinctive, high level and well-known Teaching Research University, focus on the training of social responsibility, innovative spirit, specialized knowledge, practical ability, a healthy body and mind of the application of senior professionals to provide disciplinary basis for protection. We according to the data structure curriculum overall construction plan, in the teaching method and the method, the curriculum appraisal and so on has done the following construction.

Keywords: *Data Structures;Teaching Method; Evaluation System Reform*

The specialty of information and Computing Science is a cross-discipline specialty with the background of information field and the combination of mathematics and computer information management. Students in this major have a good mathematical foundation, can use computers skillfully, and are initially equipped to do scientific research and solve practical problems in a certain direction in the field of information and computer science, ability to design and develop relevant software.

Data Structure (A) is one of the most important basic courses in the curriculum of information and computing science. It plays an important role in improving students' practical ability and theoretical level. Since the Data Structure (A) course of the information and Computing Science Major was declared as the first "comprehensive curriculum reform" program and the first-class Curriculum cultivation program at the school level, the members of the project group have further clarified the idea of curriculum construction, in accordance with the overall construction plan of the curriculum, we should promote the construction of the teaching methods and means of the curriculum and the assessment and evaluation of the curriculum team.

I. TEACHING METHOD

In terms of teaching methods, lectures, discussions and special lectures are used together to impart knowledge in a scientific, lively and flexible way and to cultivate students' creative thinking. While the teachers carefully organize the lectures and pay attention to the normal operation of each link, they also take different methods to explain the different teaching contents, so that the contents of the courses are both clear and easy to understand, it also has a prominent focus and distinctive features. The teaching content is flexible, which includes the necessary teaching contents and the optional teaching contents according to the needs and characteristics of different specialties. We use the method of combining traditional classroom teaching with modern multimedia teaching, and the method of combining electronic teaching plan with blackboard writing in class, and according to the course content needs interspersed with some animation, audio and video, fully arouse students' interest in learning.

While paying attention to the theory teaching, the emphasis strengthens to the student ability raise. In the teaching process, according to the learning problems found at any time, students are organized to carry out analysis and discussion in class, to inspire students' pioneering thinking, and to carry out regular extra-curricular thematic discussion, with the background of practical problems, so that students can analyze the problems themselves, solve problems, so as to fully tap the potential of students to promote their overall quality.

By arranging proper amount of exercises after class, students can further consolidate and improve their ability to comprehend and apply what they have learned in class. In choosing exercises, on the one hand, we should pay attention to the mastery of the knowledge of the three basics (basic theory, basic methods, and basic skills) , and on the other hand, we should also give full consideration to the flexible application of knowledge so that students can solve problems from various angles and in various ways, both exercise their systematic thinking, and improve the ability to analyze and solve problems.

To further clarify the teaching objectives, and to actively develop research-based teaching methods such as problem-based inquiry, case-based discussion, project-based participation, etc. by using various teaching methods such as lectures, demonstrations, exercises and thematic discussions, develop students' ability to find and solve problems. Continue to promote and improve the existing curriculum construction in the middle school students self-discussion links, guide students to think positively, strengthen classroom and after-class interaction, improve the curriculum learning activity. For example: On the post-order non-recursive traversing binary tree case class discussion, students actively participate in active discussion, and achieved good practical results.

In order to meet the needs of modern teaching, on the basis of traditional teaching, we make full use of modern science and technology, widely apply multimedia teaching courseware, electronic teaching plan, teaching software and course website, and enliven the classroom atmosphere, fully mobilize the students to learn the subjective initiative. Focus on students to master a variety of commonly used data structures and algorithms, and strive to improve students' ability to analyze, build, solve practical problems, and lay a good foundation for future learning and research.

Through the renewal and reform of teaching methods and teaching methods, students' understanding and mastery of the content system of Data Structure (A) have been promoted to a great extent. Under the same condition, the scores of the

students from Grade 2013 to grade 2018 who implement the curriculum reform are higher than the students before the curriculum reform. Since the data structure curriculum reform has been implemented, the teaching content, the teaching method and the teaching method renewal and the reform effect is remarkable.

II. COURSE EVALUATION SYSTEM

The course of data structure is the core basic course of computer science and the important foundation of designing and realizing compiler program, operating system, database system and other system program. Students generally reflect that the course of data structure is very difficult, with many contents, comprehensive and practical, and it is difficult to understand and master some abstract concepts and algorithms.

Examination scores have long been used as an important means to check and assess students' mastery of the curriculum. The traditional examination paper reveals the defect of "one test determines the whole life" . This examination method is not suitable for the current cultivation of applied talents. Therefore, it is imperative to reform the traditional examination method. Through the reform and practice of examination mode in the reform of data structure comprehensive course, the ability of program design, data abstraction and application of students has been improved comprehensively, and the teaching quality of data structure course has been improved.

In the course of the data structure curriculum reform, the research group further explored reasonable and efficient assessment methods and methods, and adopted various course assessment methods, the assessment method can be composed of classroom interaction, in-class Homework, in-class test, investigation report, final examination results, experimental results and related innovation and practice results.

At present, the examination mode reform has been implemented in the examination of the course "Data Structure (A) " for the major of information science from 2013 to 2018. The evaluation system includes classroom attendance, in-class Homework, in-class test, final examination results and related innovative and practical achievements. And plans in the future "Data Structure (A) " curriculum to continue to implement improvements.

The students from Grade 2013 to grade 2018 who have carried out the examination reform generally indicate that the degree of mastering the course of data structure and the degree of participating in the course are higher than before the examination reform. Since the comprehensive reform of data structure course has been carried out, the reform of examination method has achieved remarkable results.

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