Practice and exploration of project introduction task driven teaching method in data structure teaching

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Absrtact: data structure is one of the core courses of computer specialty. Aiming at the problems existing in the current teaching of data structure course, this paper discusses the task driven method of project introduction. While putting forward the teaching objectives, this paper introduces relevant knowledge points in the way of project introduction, realizes the completion with hierarchical[1] task drive, trains students' project development ability and trains application-oriented talents of computer specialty.

Keywords: **project import,Task driven, data structure[2]**

The core course of computer specialty includes data structure, which plays a connecting role in the curriculum system of computer specialty[3]. This course can cultivate students' ability to analyze and solve problems, improve students' thinking and programming ability, and has a far-reaching impact on students' subsequent learning of other courses of computer major[4], participating in postgraduate entrance examination and engaging in computer related industries after graduation. It is particularly important for the effective learning of data structure course.

I. Existing problems

The concept of data structure course is abstract and logical, involving different data logical structures and storage structures, as well as the algorithm design based on this, it is difficult to learn in general.

The data structure uses classic teaching materials. The program design part of each chapter focuses on the code. It is difficult for students to imitate and run a complete program, which brings confusion to beginners.

Each chapter of the data structure has its own system, focusing on various independent algorithms. There is a lack of complete case application, and students can not flexibly use what they have learned to solve the corresponding problems in real life.

Most data structures are programmed in C language. Some students have a weak foundation in C language. They can't skillfully use the key knowledge points such as functions, pointers and structures that need to be used, and their programming ability is seriously insufficient. As a result, they can understand in class, but they can't write the program.

The traditional teaching method, which is dominated by teachers and supplemented by students' listening, puts students in a passive position, makes it difficult to give full play to their initiative, and the classroom learning efficiency is not high, which affects the interest of curriculum or professional learning.

II. Project introduction teaching

Project import[5] mainly refers to selecting an appropriate project at the beginning of each chapter to complete a project, set teaching objectives and organize the completion of

teaching contents according to the necessary knowledge points, basic abilities and comprehensive quality of the whole engineering project.

The main principle is to let students simulate the process of project development in their jobs[6], learn by doing, from theory to practice, and through learning to independently develop and design software, so as to improve their ability to solve problems and meet the requirements of application-oriented talent training.

The key link is how to select the project. First, teachers should carefully select examples close to daily life and familiar to students as projects. Interest is the best teacher. Projects that students are familiar with and interested in can attract students' attention, improve students' learning enthusiasm and stimulate students' learning interest. After the project is set, it is divided into multiple tasks. The teaching contents are introduced according to the teaching objectives. When the teaching contents are completed one by one, several tasks are completed step by step. Students will master the development method of the complete project and understand the specific application of the new chapters, rather than simply learning a few concepts, several types of definition methods or the preparation of several algorithms.

For the course of data structure, some project examples are set as follows according to the main chapters:

TABLE I

EXAMPLES OF PROJECTS

Chapter content	entry name
Linear table	Student information management system
Stack	Number system conversion
Queue	Bank queue
Strand	Application of security tips in network
Arrays and generalized tables	Application of personalized recommendation system
Tree	File storage path in PC
Chart[7]	Application of minimum communication network
Lookup	Query address book
Sort	Online shopping mall item sorting

After learning the contents of the whole book, you can set up a comprehensive program project design to connect some knowledge points of the whole book. Let students be more proficient in the whole process of project design, have more experience in project design, and apply what they have learned to practice.

III. Task driven Teaching

Task driven is to divide the project task into several small tasks, and assign the small tasks to students. The application of relevant knowledge points is completed. After a certain time, each small task is comprehensively linked and implemented in code to complete the whole project.

In the specific operation, task driving should follow the principles of from outside to inside, from shallow to deep, step by step, etc. After students understand the basic knowledge points, they can define the basic data types, design algorithms and write programs, which is a rising process of understanding and application: they can analyze the required data structures and storage methods, design relevant algorithms and implement them in code, and consider a certain time complexity and space complexity.

Before class, teachers can remind students to review C language programming, provide students with electronic teaching materials such as data structure, electronic teaching plan and course question bank, and improve students' ability of extracurricular independent learning. The class students are divided into groups of five in advance. Each group selects students with strong learning ability as the team leader, gives full play to the advantages of teamwork,

completes the assigned tasks, and plays the role of help and guidance at the same time, so that every student in the class can participate in learning, and can jointly carry out group discussion, learn from each other, explain to each other and make common progress.

In the class, the teacher is the main one. First, the knowledge points are introduced, the projects are divided into small tasks and assigned to the students to complete them one by one. At this time, with the students as the core, some students are invited to ask questions, blackboard demonstration and explanation of program fragments. The teacher then evaluates and summarizes the completion process and results of the students. When all small tasks are solved one by one, the whole knowledge point framework is generated, and students can complete the whole project by integrating all codes. The task driven teaching method allows students to be the protagonists. By exercising their pre class preview and explanation and participation in class, it greatly cultivates students' ability to consult and refine materials outside class, improves their ability to play and speak on the spot, and can mobilize and improve students' learning enthusiasm to a certain extent.

Computer class is an important part of execution exercise. Students need a lot of computer operation time to complete the program corresponding to the algorithm, run and debug independently, fill in the experimental[8] report, and give solutions to key problems and experimental experience. Finally, the running results of the complete project program can be debugged to verify whether the application of the learned knowledge points is correct and on what occasions. Through group cooperation, students' communication ability and teamwork spirit are strengthened.

After class, students can be appropriately provided with some exercises. The difficulty is divided into necessary questions, optional questions and additional questions. The third category allows students to choose according to their own ability, learning situation and self requirements, help students consolidate their knowledge points and increase a little challenge, which is not only satisfied with learning a course, but also the cultivation of autonomous learning ability[9], the improvement of interest and the impact on the long-term planning of personal development.

Based on many years of teaching experience and aiming at the problems existing in the current data structure teaching, this paper puts forward the traditional teaching method[10] of combining project introduction and task driving, adopting the way of project introduction and task driving to improve the data structure. Practice has proved that it can help students learn data structure well, master good learning methods and be familiar with the process of project development, and play a great role in students' employment, postgraduate entrance examination and school training of Applied Talents in the future.

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