Study on Teaching Methods of Database Application Courses

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Abstract

Database technology is one of the most widely used computer science and technologies. So “database” is a very important course for computer science and other related professional major programs in universities. According to the characteristics of local normal universities, this paper discussed the course design and provided a set of reform programs.

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1. Introduction

With the enlargement of college enrollment, college education in China has been converted from the traditional elite education to mass education. But now many colleges and universities still adhere to traditional research training education model. The database curriculum continued to use traditional educational mode in different degrees, emphasizing on theory, ignoring the practice, disregard of the different background and market demand, which definitely affected the adaption ability to the society by the students.

Database technology is one of the most widely used technologies in computer science and technology. It is widely used in computer-aided design, artificial intelligence, e-commerce, administration and science.

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and has become an important basis. Therefore, the database is an important university courses for computer and related majors. "Database Application and Design" focuses on the background of the database design and database management, programming design in front of other courses, such as "WEB programming" introduction, between the two is often out of touch, the contents of the database and programming languages are not well linked, but are fragmented and isolated. Now we are trying to combine these two programs to work closely to develop teaching programs in one semester and combined with case teaching, and enable the students to understand the entire development and design process of the integrity of a database management system from front to back.

2. Course configuration

In recent years, we are explored in course configuration, as shown in Figure 1. “Principles of Database” is in the first level. The database application course is in the second level, Such as a large database "SQL Server" and "Database Application and Design" and other related courses. “Management information systems”, “Web programming” and other related courses are in the third level. Therefore, students can grasp the principles of database systems, application and practical skills from the three levels. This teaching model produced good results for our students.

![Fig.1 Architecture of the database course](image)

3. The reform of "Database Application and Design" curriculum

As database technology is one of the fastest growing areas in computer. Since 1960’s , database has developed from the beginning of the first generation of network databases, hierarchical databases, to the second-generation relational database, then to a new generation of object-oriented database systems, distributed database systems, parallel Mobile database system, database systems and data warehouses. The contents of the courses should also be continuously adjusted, keeping the pace of development of
database technology, meanwhile work closely with market demands. A brief introduction should be make to the cutting-edge database technologies, such as between words logic, object database, recursive SQL, object relationship graph, XML technologies and middleware, WWW and databases, ODBC, JDBC. By such doing, the students could understand the changes and development of the database.

4. The reform of teaching methods

4.1. Using the modern ways of education

We should take the advantage of multimedia sound, text and animation, simulating the process and effects of the database, motivating the students. Thus we can increase the amount of knowledge and information to improve teaching efficiency and teaching quality. The use of these teaching methods, students not only actively participate in teaching activities, but also fostered strong interest in educational technology, which will promote the initiative and awareness of learning knowledge and promote the overall quality of the students.

4.2. The project-driven approach

We suggest to use the "project-driven approach" in the teaching on the basis of constructivist learning theory, with the establishment of project-driven "assimilation and accommodation" of the learning conditions, with the first re-circulation of the "scenario", the second re-circulation of "collaboration", the third re-circulation of the "conversations" having a "construction of meaning" of the teaching.

In teaching, according to the training objectives of undergraduate education and student characteristics, we can design the teaching as a core example --- the development of the student achievement management system, the combination ways of using the project-driven approach and the case teaching method. The reason for choosing such a system is that students are more familiar with the system operation, so they can concentrate on the main course of study on the database without having to spend a lot of time for business analysis.

4.3. Strengthening the experimental aspects

"Database Application and Design" is a very practical course. we attach importance to basic knowledge, engineering discipline for database and application, strengthening the teaching of experimental procedures in the training, to enhance students’ awareness of team spirit and team training. In practice, the curriculum is designed in accordance with a series of experiment on the computer, and a large Project. Experiment on the computer is closely combined with the basic knowledge and skills, installing the database from the RDBMS, supporting the experimental aspects of systems theory to help students understand and digest course content in the actual hands-on DBMS and experiment, and submitted a standardized machine test report. Combining the theory with practice and integration of learning book knowledge and practical test will not only help students master the basic theoretical knowledge, but also enable students to master the knowledge of science and foster the self-learning ability o and motivate them the passion for learning.

4.4. Improving the traditional assessment method

Appraisal is an effective way to test the effect of teaching and an important guideline for students and teachers. Traditionally, the scores of the end of the theory tests are the main factors to evaluate the
students, resulting that most of the students had to pass the exam and the school does not focus on improving their own capacity. It is not conducive to stimulating the students. We used to test the students in written form. After teaching in the implementation of the project, we found that the written examination can not effectively reflect the teaching of the loopholes, so we changed to ask the students to turn in their research and development work as the content of the exam, as long as the students can solve the problems on their own. In this way, the students’ practical skills can be effectively cultivated. A practical score standard will enable students get good command of key concepts and principles and understanding. Students can examine the integrated use of knowledge to solve practical problems and create thinking skills. In order to avoid inactive participation, students are randomly drawn to assess group's performance, which will promote mutual supervision, mutual learning within the group and increase the enthusiasm and sense of achievement.

5. Conclusion

In recent years, Harbin Normal University is undergoing the teaching reform in our database design and application of our teaching. We combine a variety of teaching methods and teaching resources in a rational way and provide students a good learning environment. We use the constructivist theory, with the students as the center, give full play to the initiative of students, mobilize student interest in learning and cultivate the innovative spirit and practical ability to develop more practical and complex talents for the society.

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