Exploration and Practice of the Reform of the Practical Teaching Mode of the Database Course Centered on Students

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Abstract: In order to improve the practical teaching quality of database course and stimulate the students' initiative and enthusiasm in learning, based on the analysis and summary of the existing problems in the practical teaching of database course, a progressive practical teaching system centered on students is put forward, which is reformed from the practical teaching content, practical teaching means and methods and practical assessment methods of the course. According to the teaching system of the library course, reform and practice have been carried out. The practical results show that students have a deeper understanding of theoretical knowledge, and their practical ability, communication ability, cooperation ability and comprehensive ability are improved to solve practical problems by using professional knowledge.

1. Introduction

As a core course of information management and information system specialty, database course has strong theory, practice and application, and plays an important role in training students' practical innovation ability. This course requires students to have a strong ability of database design, database application system development and management on the basis of mastering database theoretical knowledge, and be able to flexibly use database technology to solve practical application problems. Therefore, many colleges and universities have increased the hours of practical teaching to strengthen the cultivation of students' practical ability and innovation ability. Through relevant literature search, it was found that at present, domestic colleges and universities are studying how to reform the traditional practical teaching mode of database course according to the characteristics of the school itself, so as to build a set of practical teaching system suitable for their own database courses.

2. Analysis of the Existing Problems in The Current Practical Teaching

In order to analyse and summarize the existing problems in the practical teaching of database courses, the members of the research group conducted a large number of literature searches, conducted online and offline consultation and exchange with the database course teachers of other colleges and universities for many times, and visited and investigated many IT enterprises on this field, discussed with the relevant personnel of enterprises to understand the needs of enterprises for database talents and the data knowledge and skill requirements of the talents. Through the investigation of the above channels, the members of the project team carried out many discussion activities, analyzed and summarized the following problems in the database experiment teaching of the information management major in our university.

Firstly, the content of practical teaching does not reflect the present needs of society, resulting in the disconnection between talent training and actual needs.

Secondly, in the process of practical teaching, there is a lack of effective process monitoring mechanism, which makes the practical teaching become a mere formality at last. Students make a fool of each other and fail to achieve the purpose of practical teaching.

Thirdly, in the traditional teaching, the combination of classroom teaching and computer experiment is generally adopted. In the classroom, the teacher mainly explains, and the students can verify it when they do the computer experiment. Due to the limitation of the laboratory and time, there is sometimes a relatively long interval between the content of the course explanation and the

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experiment on the computer, which makes the students forget most of the content of the teacher's classroom when they are on the computer, the quality and efficiency of the practice is difficult to be guaranteed, and the students gradually lose their interest in the database course.

Fourthly, although the teachers have been in the front line of teaching for a long time, they focus on theoretical teaching, have few opportunities for enterprise practice, and fail to understand the development trend of the society in time. They do not understand the latest information system applied by enterprises and the business categories and business technologies of various industries in depth. Due to the lack of adaptability and pertinence, the professional knowledge and skills learned by students are not closely connected with the actual needs of the society, and there are some deviations.

In view of the above problems, combined with the database teaching experience of many teachers, we intends to reform the content arrangement, teaching methods and assessment methods of practical teaching, and puts forward a progressive database practical teaching system centered on students, aiming to stimulate students' autonomy and enthusiasm in learning, so that students can use the learned knowledge to solve the problems while mastering the theoretical knowledge of database practical problems, to improve the practical ability of students, to meet the new requirements of the quality and ability of database talents in society.

3. Practical Teaching Reform Centered on Students

3.1 The Reform of Practical Teaching Content

According to the course system database practice teaching of the subject, it is divided into three levels that is basic practice, comprehensive design practice and innovative practice [1].

Basic practice enables students to get practical basic training in database application and database management, which can deepen the understanding of what they have learned and enhance the effect of theoretical teaching.

After mastering the basic practice training, students need to complete the comprehensive design practice with certain difficulty and complexity. The practical topic selection should be combined with the application field that the students are familiar with, and adopt the way of combining teachers' and students' self-determination. Students are required to take a database application system of an industry as an example, and use specific programming language to develop database system programming with mainstream database software. In the training process, a development cooperation group is formed, the number of people is determined flexibly by the complexity of the database system. Each group member cooperates according to the steps of database design, and jointly completes the tasks of demand analysis, conceptual structure design, logical structure design, physical design, database implementation, system development, etc.

Innovative practice projects include innovation projects extracted from real life by students and innovation projects extracted by teachers according to scientific research projects. Innovation ability can be improved by participating in relevant innovation and entrepreneurship competitions. Under the guidance of the instructor, students can expand their ideas, select innovative and practical topics, and then work together according to the selected topics. Because it is the topic chosen by students themselves, it will greatly stimulate their interest in learning and their awareness of innovation. In the process of completing the work, students will face many problems, which will exercise their ability of autonomous learning and problem-solving.

3.2 The Reform of Practical Teaching Method

In order to achieve the purpose of database practical teaching, we should adopt diversified practical teaching methods according to different levels of practical teaching. The progressive practical teaching mode centered on students takes students as the main body and ability training as the core. In the process of practical teaching, in order to achieve the purpose of database practical teaching, we should adopt diversified practical teaching methods according to different levels of practical teaching.

The basic practice project mainly comes from the book content. In the teaching mode, it adopts

the teaching method of giving priority to the teacher's guidance and giving proper guidance to the students. The comprehensive design practice project mainly aims to improve the comprehensive application ability of the database theory and technology of the students in the actual project. Based on the concept of CDIO, the teachers can adopt the "project-based teaching method" such as the case teaching method and the project driven method. It enables students to complete tasks in all stages of the project in" learning by doing " [2]. For innovative practice projects, teachers can adopt heuristic teaching to guide students step by step and encourage students to carry out inquiry learning. Rich teaching methods make the process of experimental teaching not boring any more, and make students fully experience the happiness of exploring and solving problems in the practice platform and real project practice activities [3].

3.3 The Reform of Practical Assessment Method

Most of the current practical teaching assessment methods take the experimental report submitted by students as the assessment standard, without considering the type of practical teaching and the assessment of students' ability in practical teaching. According to the characteristics of different types of practical projects, different assessment methods should be adopted.

For the basic practice, we can give students' scores based on experimental reports. For the comprehensive design practice, teachers should supervise students in the process of practice, require students to submit periodic reports and results, and finally complete the database departments such as topic selection, demand analysis, conceptual structure design, logical structure design, functional module design, coding, debugging and etc. And students submit a complete experimental report, and ask each student to demonstrate the results of practice, so as to give the score. You can also work in groups. Each group works in a team to complete this task together. Finally, the team submits design documents, the team leader demonstrates each design, organizes teachers to reply to each group's innovative design, and comprehensively evaluates team performance and personal performance [4].

For innovative practice and specific application projects, the results obtained by students participating in innovation and entrepreneurship competition can be used as the assessment basis [5]. At the same time, students are encouraged to participate in off campus practice. The results of students' participation in competitions and off campus practice can replace the results of on campus practice courses [6].

4. Reform Practice

Taking the students major in information management and information system of our university as the reform practice object, the reform practice is carried out for the content and methods of practical teaching and practical assessment methods.

4.1 The Improvement of Practical Teaching Content

There are three types of practice content in the course of database principles and applications. According to the course theory teaching content, basic practice content is set in the practice part of the course, so as to deepen students' understanding of what they have learned and improve the theoretical teaching effect. Comprehensive design practice content is set in the course design part, so that students can choose their own topics, form teams freely, and according to the steps of database design team members work together to complete the design of database application system in a certain industry or field, so that students can deeply understand the whole process of database design. At the same time, organize students to participate in all kinds of innovation and entrepreneurship competitions at all levels, select innovative and practical topics, and complete the analysis, design and development of the project with the knowledge learned under the guidance of teachers. It has trained students' ability of autonomous learning and solving practical problems, and greatly stimulated students' interest in learning and innovation consciousness.

4.2 The Improvement of Practical Teaching Methods

The basic practice project mainly adopts the teaching method of teachers' guidance and students'

proper guidance. At the same time, we need to focus on the students' understanding and mastery of basic knowledge. According to the students' mastery, appropriately improve the difficulty of the project for the students who have a good grasp of it, and give key guidance to some students who have difficulties in learning, so as to achieve the goal that all students of the basic practice project can fully master and skilfully apply it.

The comprehensive design practice project mainly adopts the teaching methods of case teaching and project driving. At the same time, the team members work together to complete the whole project, which not only improves the students' comprehensive application ability of using database theory and technology to solve practical problems, but also exercises the students' communication and cooperation ability.

The innovative practice project adopts the way of encourage and reward to incite the students to actively participate in all kinds of innovation and entrepreneurship competitions at all levels. They can form teams across different grades and disciplines to participate in the competition. Combined with their professional knowledge and ability, they can choose innovative and practical topics, give full play to each student's professional expertise, so that the students can fully experience the joy of solving problems in the real activities. At the same time, the students who participate in the competition will be given extra points in the usual performance of the course. It not only improves their personal ability but also obtains better results, so the participation of the students is very high.

4.3 Improvement of Practical Assessment Method

For the basic practice, the report of the computer experiment is the main part, and the performance of the computer practice is the auxiliary part.

For the comprehensive design practice, teachers supervise and assess the whole process of students' practice, give full play to students' subjective initiative, students are divided into several groups independently, each group member selects a group leader, and then the group leader is responsible for the division of project tasks, and jointly complete the practice project. After the completion of the project, members of the group shall evaluate each other, and the team leader shall give each student a score according to the workload, completion and evaluation results of each group member. At last, the comprehensive evaluation results are given by the teacher according to the performance of the students' computer experiments, the quality of the design instructions, the demonstration of the program, the score of the answer and the results of the self-evaluation in the group.

For the innovative practice, according to the specific application projects, combined with the achievements of students participating in the innovation and entrepreneurship competition as the assessment basis, the course will be given bonus points in the usual performance.

5. Conclusion

In the process of carrying out the reform, both the practical teaching content and the teaching means and the assessment methods pay attention to the students as the center, the learning ability and the learning effect of the students, the process monitoring and the quality supervision, at the same time, the targeted supervision and assistance of the students with learning difficulties, and the principle of paying equal attention to both teaching and educating people, so as to form a good learning style and teaching style, and really do it to all for students.

Through the combination of online and offline, we have had many discussions with relevant students and listened to their feedback and opinions. Students generally reflect that they have gone through a series of practical activities, such as experiments in class, exercises after class, concentrated practical training, competition and actual combat. They have a deeper understanding of theoretical knowledge, and their practical ability, communication ability, cooperation ability and applied professional knowledge to solve practical problems are improved. Various forms of practical activities have inspired students' enthusiasm and initiative in learning. There are more students who actively communicate with teachers and discuss problems in class, more students who actively participate in various competitions at all levels and win awards, and the depth and difficulty of

completed projects have also been improved. It is not difficult to see from the final assessment results that the above reform practice has basically achieved the expected results, and in the next stage we will improve the reform program further in order to achieve better teaching effect.

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