Exploration on the Teaching Reform of the Principle and Application of Database Against the Background of Transition

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Abstract—The reform and development of the higher education in China is in an important period of transformation and development. How to accomplish the transformation of college specialty and cultivate high-quality and applied talents with excellent comprehensive quality is a problem that all local undergraduate higher educators should think about.Based on the analysis and reflection of the current teaching situation of the course "Principles and Applications of Database", this paper puts forward some reform measures in terms of syllabus, teaching materials, practical teaching, course assessment system, teaching methods and teaching team. Good results have been achieved in students' application and practice, which greatly improves students' innovative spirit and ability.

Keywords—course assessment system; practical teaching; teaching methods; teaching team

I. INTRODUCTION

The reform and development of higher education of China is in an important period of transformation and development. In this transformation, the local ordinary undergraduate colleges and universities are faced with the severe challenges [1]. With the acceleration of the transformation from the local undergraduate colleges to applied technology universities, all educators engaged in local undergraduate higher education need to think about some problems, such as how to complete the transformation of college specialty and train high-quality and applied talents with excellent comprehensive quality.

The course of Principle and Application of Database is one of the compulsory core basic courses of software engineering specialty, which occupies a very important position in the whole software engineering personnel training system [2]. It is not only the synthesis and promotion of the leading courses such as programming language and data structure, but also the important foundation of the following courses such as software engineering and advanced programming. Therefore, it is necessary to study the teaching of the course, find out the existing problems, and reform and practice the course according to the problems [3]. Through the reform of teaching contents and methods of the course of Principle and

Application of Database, it can strengthen students' basic knowledge of database and their ability to apply database in future information management. At the same time, it meets the requirement for the talents of the core courses for undergraduate majors in the transitional development.

II. ANALYSIS OF THE TEACHING SITUATION

Some problems have been found in the current teaching process through the analysis of the present teaching situation of the course of Principle and Application of Database, combining with the research of database-related practice skills in curriculum design of the related follow-up courses, graduation practice and graduation design.

A. Practice Content Can not Keep up with the Development Trend of Software Industry

Because of the rapid development of database technology and the rapid updating of database management system, many new technologies have been adopted [4]. However, the updating of experimental content in database textbooks is relatively slow, especially the experimental environment can not keep pace with the current development. In the experimental textbooks, the database management system is always behind the popular database management system.

B. Teaching Methods and Means are Outdated

In the process of teaching, teachers play a dominant role, and the content and rhythm of courses are all controlled by teachers [5]. Especially, there are many professional terms in this course. It is often difficult for beginners to clarify the relationship between various concepts. Teachers spend a lot of time explaining relevant theories while students passively accept knowledge [6]. There is a lack of interaction and communication between teachers and students in class. Classroom teaching survey shows that most students think that database knowledge is boring, content is complex and difficult to understand, and concept is abstract.

C. Lessons are Limited and the Effect of the Practical Training is not Good

Courses generally focus on the combination of theory and practice, so a certain proportion of practical courses will be arranged after the completion of theoretical courses. But

usually the class hours are limited, and many practical tasks can only be completed by students after class. This leads to the problem of students can not be solved in time, teachers can not supervise whether students complete the training independently, and even there will be the problem of mutual plagiarism.

D. Some Teachers Lack the Ability of Engineering Practice

Most college teachers come directly from colleges and universities. There is a lack of skilled personnel with engineering background, and the structure of teachers is unreasonable. When receiving higher education in engineering, teachers experienced the traditional training mode of emphasizing theory rather than practice, and lacked sufficient engineering practice training, which lead to the inadequacy of some teachers' engineering practice ability.

E. The Way of Course Assessment Needs to be Perfected

For a long time, the main part of the course assessment is the final course assessment. On the one hand, in order to enable students to complete the exam in the prescribed time, the paper capacity is limited and it is difficult to cover the comprehensive content. On the other hand, it emphasizes the examination of understanding and mastering knowledge points such as concepts and principles, which is not conducive to cultivating and training students' ability to use basic theories to solve practical problems. Finally, the assessment content is textbook and note-taking, which emphasizes knowledge memory and easily neglects the assessment of students' ability of analysis and innovation, which results in students' lack of initiative to cope with the examination.

Faced with these problems, we need to optimize the teaching content, change the teaching methods and means, gradually strengthen students' basic knowledge of database and their ability to apply database in future information management by changing teaching concepts, strengthening practical links, encouraging and guiding students to participate in professional competitions, and participating in real project development.

III. REFORM MEASURES

A. Combining with the Needs of Industries and Enterprises, the Teaching Content is Optimized and a New Syllabus is Formed

The database industry is investigated to obtain the data needed for talents in the database industry. Then according to the requirement of current information system projects for database knowledge, a new outline is formed to meet the functional, non-functional and talent quality requirements of enterprise informatization projects. Students must master the basic theory of database, database analysis and design technology, database implementation and database management technology and other topics.

B. Construction of the Course Case Set

Based on the real work task and work process, the curriculum content has been adjusted, optimized, integrated, and the organic combination of theory and practice has been realized. The new teaching content system is divided into five modules, 13 projects and 14 learning situations, including the design of conceptual model, the design of relational model, the

creation of database, data query, data statistics, data update, the use of stored procedures and triggers, and the security maintenance of database. These are the tasks at each stage of learning database management from easy to difficult.

C. Refinement of the Practice Teaching

The practice teaching includes in-school experiments, in-school training, innovative activities and fixed-post practice. The contents of the experimental practice include verification and design experiments, mainly examining the knowledge of each stage. Through the comprehensive subject, in-school training examines students' comprehensive application ability.

D. Forming the Evaluation System of the Course Assessment

The course of Principle and Application of Database is closely combined with theory and practice. If the traditional evaluation method of theoretical examination only adopted, it will cause students to study for passing the examination, and pay no attention to improving their ability. Therefore, according to the teaching objectives of the course, the course adopts a stage assessment system based on knowledge, ability and attitude.

The evaluation of this course mainly examines the theoretical basis, technical ability, engineering quality, communication ability, collaborative ability and innovation ability. The assessment is carried out through routine assessment, experimental assessment, extra-curricular project homework assessment and final examination. The different assessments are credited to final results according to different weights. Among them, the daily assessment and experimental assessment are formative assessment, the extracurricular project assignments are procedural assessment, and the final assessment is final assessment. Through the cooperation of each link, the ultimate goal of training students' practical ability and application ability is realized. The daily assessment mainly examines students' learning attitude and effect through teachers' normal teaching process. The experimental examination mainly inspects students' performance and experiment completion, and mainly examines students' technical ability and engineering quality. The assessment of extracurricular project assignments mainly examines students' ability to design and develop database application system by using database principles, design and development knowledge, and to assess students' communication ability, collaboration ability, engineering quality and innovation ability. The final examination mainly examines the students' comprehensive theory and knowledge of the database. By adopting the stage assessment system based on "knowledge+ability+ attitude", it greatly stimulates students' learning enthusiasm and interest, promotes students' learning consciousness, cultivates students' engineering literacy, improves team cooperation ability and communication ability, and better achieves the teaching objectives.

E. Forming the Effective Teaching Methods

Teaching is organized by project-oriented and task-driven teaching methods. Combining with the project of management system, the effective combination of guiding teaching method and discussing teaching method, the knowledge structure is ordered, sorted out and interpenetrated. The teaching fully

embodies the design concept of taking students as the main body. These teaching methods complement each other, which not only cultivates the students' ability of design conception and innovation, but also completes the cultivation of students' comprehensive vocational ability and self-study ability.

In the process of teaching, teaching has changed from traditional teachers singing monologues to teachers and students participating together. Through defining tasks, demonstrating and guiding, making plans, organizing and implementing, checking and evaluating, the process of teaching, learning, doing, evaluating and creating is integrated. At the same time, it greatly mobilizes students' learning enthusiasm, deepens students' memory and improves the quality of teaching.

F. Constructing the Excellent Teaching Team

The construction of teaching team is the fundamental guarantee of curriculum construction. Professional core curriculum teachers are responsible for timely understanding of the industry's current situation, technical needs and development trends. The training of high-quality talents needs high-level and high-quality teachers as a guarantee. At present, the teachers in colleges and universities lack engineering practice background.The teachers in teaching teams are engaged in production work and activities in relevant enterprises and industries to improve their engineering literacy. At the same time, schools and enterprises jointly build teaching staff, inviting outstanding talents with certain engineering background or with certain engineering practice experience and academic attainments to schools, and introducing engineering concepts, engineering problems, engineering experience and engineering thinking into classroom teaching.

IV. CONCLUSIONS

The course of Principle and Application of Database is one of the compulsory core basic courses of software engineering specialty. It is a professional basic course with strong technical practicality. The paper puts forward the ideas of curriculum reform from the aspects of teaching content, course case set, course evaluation system, practical teaching, teaching methods, teaching team and so on. The basic idea of the reform has been extended to the relevant courses of various software engineering specialties, which will play a great role in promoting the ability of the students.

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