

Design of Teaching Mode for the Course "Introduction to Database Systems" in the Network Environment

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Abstract: In the current context of new engineering, by optimizing and improving the existing teaching content and methods, the teaching effectiveness and quality of the database system overview course can be comprehensively improved, thereby breaking the traditional course content system and building a complete and comprehensive teaching platform on the basis of the original teaching. By utilizing various teaching resources reasonably, students' comprehensive and professional literacy can be comprehensively cultivated. This article conducts research and analysis on the teaching mode design of the course "Introduction to Database Systems".

1. Introduction

In order to improve the effectiveness and quality of database system overview course teaching, universities should actively introduce diversified and multi-level teaching methods, and effectively integrate teaching content with the relevant characteristics and advantages of the major. Through project-driven practical teaching classes, a teaching platform should be created, and existing assessment content and methods should be optimized and improved.

2. The current teaching situation and existing problems of the course "Introduction to Database Systems"

"Introduction to Database Systems" is a compulsory course for students majoring in computer science in universities. With the continuous development of technology in China, artificial intelligence technology and internet technology have been continuously promoted, improved, and optimized. Traditional database teaching methods only briefly explain theoretical knowledge, allowing students to have a preliminary understanding of SQL language operations, without combining the latest cloud computing technology, and the new demand for databases posed by big data technology. At the same time, in the context of the current new engineering discipline, we should clarify the teaching objectives when training students. We should not only train students' professional and technical level, but also train students' engineering practice ability, so that we can timely follow the opportunities of the era revolution and the technological revolution, and ensure that the trained talents meet the needs of society.

3. Problems in the teaching of the course "Introduction to Database Systems"

3.1. The teaching mode is relatively single

Firstly, under the traditional teaching mode, theoretical teaching is more emphasized. However, during the implementation of the course "Introduction to Database Systems", teachers pay more attention to the explanation of basic theoretical knowledge and fail to cultivate students' engineering practical and problem-solving abilities.[1] As a result, students only focus on written exam scores and do not develop practical skills, which deviates from the current goal of cultivating new engineering subjects, This makes the talents cultivated by Chinese universities lack high practical skills. Secondly, traditional education does not recognize the importance of practical teaching. Most teachers in the process of conducting practical teaching are based on the teaching syllabus and do not arrange specialized tutors to guide and guide students' practical training, resulting in significant differences in students' hands-on abilities. At the same time, some teachers, in order to complete teaching tasks as soon as possible, will explain the experimental steps and results to students in detail by writing an experimental guide manual, and ask students to strictly follow the experimental operation manual to complete practical training.[2] This leads to students not truly understanding the connotation of practical operations and not learning corresponding practical abilities, which in turn leads to low problem-solving ability of students. The existing assessment methods are relatively single and backward, and teachers mainly use textbook content and experimental outlines as the main teaching resources in the teaching process. They do not optimize and improve the existing teaching outline and content based on actual training goals, resulting in teachers being unable to investigate and judge students' learning progress and status. Teachers only evaluate and review students' learning outcomes through final exams and exam papers, and the proportion of practical operation scores is relatively small, resulting in the assessment results not being scientific and reasonable, and cannot truly reflect students' learning outcomes.

3.2. Separation of practical teaching and theoretical teaching

Most universities mainly focus on scientific research in the process of establishing performance evaluation systems, which leads to teachers and students investing more time and energy in scientific research.[3] Moreover, teachers have not strengthened their own knowledge system construction or accumulated knowledge. Specifically, in the traditional teaching process, teachers pay more attention to explaining basic theoretical knowledge and prefer to use multimedia technology to elaborate and explain complex and virtual theories, which leads to students with relatively low learning levels being unable to understand the teaching content, resulting in trained students only being able to face exam taking and problem-solving assignments. Failure to effectively integrate theoretical teaching with practical cases for experimental teaching will result in low comprehensive and professional literacy of students, which cannot meet the needs of social development. During the experimental teaching process, the teacher only requires students to complete the corresponding experimental operations and tasks according to the experimental guidance manual. Even if students have questions during the use process, they cannot combine them with the theoretical knowledge they have learned to solve and discover problems, resulting in students not being able to think and analyze independently, nor possessing the corresponding engineering laboratory thinking. They only focus on the experimental results, and there was no comprehensive assessment of the experimental process. In addition, the experimental reports produced by students are also copied according to the relevant content of the experimental guide book, without detailed records of the actual problems encountered during the experimental process or the actual methods used to solve problems. Over time, this will result in students being unable to discover, analyze, and solve problems, and also unable to cultivate their

innovation awareness and hands-on ability.

4. Overview of database systems in the context of new engineering curriculum teaching mode design

4.1. Applying diverse teaching methods

In the current situation, in the process of explaining "Introduction to Database Systems", it is necessary to organically integrate theoretical explanations with experimental operations in order to comprehensively improve the effectiveness and quality of teaching. With the continuous development of communication technology in China, diversified and multi type teaching methods should be actively introduced in the subsequent teaching process of universities, in order to break traditional time and space limitations. For example, case analysis methods, project driven methods, and flipped classroom methods can all stimulate students' learning enthusiasm and initiative, and allow them to have more interest in learning, so as to comprehensively improve the efficiency and quality of learning. In the process of carrying out database system overview courses in universities, the main purpose is to lay the foundation for the subsequent development of computer technology and database technology courses, so that students can have a preliminary understanding of the basic theoretical knowledge of database systems and master preliminary database system technology. As this part of the content is slightly difficult for first-time contacts, teachers only need to provide appropriate explanations for some parts of the content during the advancement process. Teaching is mainly based on database systems, and case analysis and project driven methods are scientifically and reasonably applied to enable students to effectively integrate theoretical knowledge with practical operations. During this process, teachers should choose various case projects related to students' lives, and through typical cases, students can understand the relevant content and applications of the database system, in order to deepen their understanding, consolidating their basic theoretical knowledge, and improve their learning enthusiasm and initiative.

4.2. Combining teaching content with professional characteristics and advantages

In the current context of new engineering, the new demands of industry and technological development for talent cultivation should be integrated into the teaching process of universities. By optimizing and improving the existing teaching content and teaching system, the effectiveness and quality of teaching can be comprehensively improved. In the current situation, most universities offer courses on database system overview, with similar teaching content. The main focus is on explaining the basic theories of databases and structured query languages, requiring students to be able to master basic theories and SQL language. However, due to limited class hours, previous theoretical knowledge related to database applications has been banned, which makes it difficult for students to understand some concepts during the learning process, and they do not know which aspects the learned theories can be applied to. As a result, it cannot stimulate students' learning enthusiasm and initiative, leading to students' aversion to learning. Under the current new engineering background, by organically integrating the teaching content with the actual professional characteristics, a student-centered case method class can be created, so that students can effectively use various SQL languages for multi table query and group query according to the actual database system design, and specifically analyze the process entities and entity relationships of the database according to the basic requirements of database system design, in order to set up a more scientific and reasonable ER diagram conversion ER diagram.

4.3. Project-driven experimental teaching

In the current context of new engineering, universities should comprehensively improve students' hands-on and practical abilities. In the process of carrying out the course of database system overview, it is necessary to clarify the main objectives of practical teaching, so that students can participate in practical teaching while learning professional basic theories, so as to comprehensively learn the application of SQL development tools, gradually master the design methods of different types of databases during the practical operation process, and further enhance students' hands-on ability, comprehensive practical ability, problem-solving ability, and problem-solving ability. Specifically, the experiment mainly includes the following aspects: 1. Database establishment, as well as the deletion and modification of various tables in the database. 2. Delete, modify, and establish views and indexes. 3. Query related data in the database, such as form queries, nested queries, link queries, etc. 4. Insert data, delete data, and modify data in the corresponding tables of the database. 5. Statements can be called to complete data storage. At the same time, in the database system overview teaching process, corresponding open experiments can also be set up to effectively integrate extracurricular experiments with various teaching contents to create open and innovative projects, so that students can effectively integrate basic theoretical knowledge and practical operations, and comprehensively improve their comprehensive and professional literacy.

Specifically, carrying out project-driven experimental teaching mainly follows the following principles: firstly, the emphasis on practical aspects should be strengthened in the course of database system overview, so that through the scientific and reasonable application of project-driven teaching methods, students can have access to real database systems in their daily life, such as library systems and ticketing systems. We should allow students to group into multiple groups and split the selected experimental projects. Through team cooperation, corresponding project design and operation should be completed. In the process of project practical teaching, it should be ensured that the set goals meet the basic needs of professional talent cultivation. While assessing students' basic theoretical knowledge level, it should also assess and evaluate their division of labor, practical ability, learning ability, and innovation ability. This will enable students to effectively combine theoretical knowledge with professional operations. Secondly, due to the professionalism of database system overview, conducting practical courses can cultivate students' learning and practical abilities. However, in the course design teaching process, students should independently complete experimental projects and gain perceptual knowledge by fully immersing themselves in the practical process. Therefore, teachers cannot use the traditional proposition based examination method to evaluate students' learning outcomes in a single way. Instead, they need to carry out standardized management and evaluation throughout their entire life cycle to ensure that students can conscientiously complete the course design and submit standard course design reports, which can record in detail the various achievements and steps in the course design.

4.4. Creating a teaching platform

In the course of database system overview in universities, various teaching resources and information can be integrated based on the teaching platform, thereby reducing students' learning costs and teachers' teaching pressure in the actual teaching process. At the same time, it can also comprehensively improve the effectiveness and quality of teaching. Specifically, students can comprehensively grasp various basic theoretical knowledge through various cases on the teaching platform, and can consolidate and deepen their learning of the textbook content. At the same time, in the process of continuous observation and summary, it can also guide students to start from reality, establish a sound, unified, and standardized theoretical knowledge system, so as to further transform the traditional teaching process mainly based on teacher explanations through problem-solving

teaching and research methods, return the classroom to students and make them the main body of teaching.

4.5. Optimizing and improving the existing assessment methods

In the traditional assessment process, the total score is mainly composed of students' daily scores and final exam scores. On this basis, universities can increase classroom performance and practical teaching related content to establish a sound, unified, and standardized assessment system. By reducing the total score ratio of exam papers and increasing the total score ratio of practical operations, a comprehensive and comprehensive assessment mechanism is formed throughout the entire process. In addition, it is necessary to actively ask and answer questions in the classroom, comprehensively reflect after class, and share interesting and expressive content in the classroom, in order to integrate it into the assessment process of students, stimulate their learning enthusiasm and initiative, and lay the foundation for creating a good, harmonious, relaxed and enjoyable teaching environment. Finally, in the process of assessing the practical content, it is necessary to combine the students' defense status, code status, and practical reports to conduct fair and impartial assessment and evaluation of students, in order to grasp their true practical level and ability.

5. Conclusion

Overall, the database system overview course is an important part of the entire computer science curriculum system, which can serve as a connecting link and a comprehensive understanding. In the current context of new engineering, universities should clarify the latest talent cultivation goals, optimize and improve the existing database system overview course teaching content and mode, in order to meet the practical needs of social development. Through scientific and reasonable application of advanced multimedia technology, students' learning enthusiasm and initiative should be fully stimulated, laying a foundation for efficient learning of subsequent professional courses.

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