Research on Inquiry Teaching of Database Course Based on Big Data

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Abstract: Nowadays, China's social economy has achieved rapid development compared with the past, and has achieved remarkable achievements. At present, the entire society has entered the era of big data. Based on the background of big data, this article has conducted a full study on how to determine the teaching content and experimental content of database courses. In combination with the actual teaching situation, an inquiry-based teaching method was formulated, and the problems existing in the database classroom teaching were analyzed and effective solutions were put forward. At the same time, it can help students better organize, manage, and store big data, do a good job of technology development, and promote a significant improvement in the comprehensive literacy of software talents.

1. Introduction
At present, the era of big data has arrived, which has greatly changed the theory and methods of data organization, management, and storage. Various new technologies have emerged continuously, so it is necessary to carefully adjust the database course teaching in accordance with the actual situation. At the same time, the current society's demand for software talents continues to increase. In the new era, software talents must master certain programming skills, computational thinking and cognitive skills. For students who are not computer majors, they need to master certain information processing skills when studying their respective professional courses. In the context of big data, scientific analysis methods and development environments are needed for protection, and interdisciplinary commitment to the study of relevant basic and unknown knowledge is required. Based on this, in view of various problems existing in the school, such as the optimization of professional courses, organization of teaching content, through inquiry-based teaching methods to help students better acquire knowledge and promote the significant improvement of their comprehensive ability [1].

2. Introduction to Inquiry Teaching Method
The inquiry-based teaching method is a classic teaching mode, which has been widely used in the teaching of primary and middle school curriculum, but according to the research nature of university curriculum itself, this teaching mode can be applied more deeply. For most research scholars, the application of this teaching mode is conducive to the cultivation of modern and innovative high-quality talents. It can optimize the content of teaching materials, help students better explore knowledge and establish a certain self-confidence. The application of inquiry teaching mode in higher mathematics teaching can comprehensively analyze and evaluate students' academic performance with time-benefit analysis. In order to better adapt to this change, we need to apply inquiry-based teaching methods in the context of big data to introduce relevant teaching links, that means, problem introduction-problem inquiry-problem solving-knowledge construction, which is designed to help teachers develop inquiry style activity teaching and creates good conditions for students to learn, and
realizes the acquisition of knowledge and the development of skills in the process of inquiry, especially in the process of database processing. We need to pay attention to the cultivation of innovative ability [2].

3. Application of Inquiry Teaching Method in Database Course Teaching
The core of the inquiry teaching method in the database course teaching is the design of the inquiry teaching experiment. The implementation of the project practice class needs to be carefully analyzed in accordance with the actual situation. It is strictly performed in four steps, namely project grouping, group inquiry, task expansion, completion and evaluation. In the context of big data, some scholars believe that it is necessary to focus on helping students develop certain database application and maintenance capabilities, help students to find problems in time with the help of database technology, and solve problems independently. In experimental teaching, it is necessary to carefully organize each link in strict accordance with certain steps. In the course of the course design, the independent completion of project development can be fully aided by grouping. In order to fully mobilize students' enthusiasm and initiative for learning in the daily teaching process, teachers need to make full use of various teaching methods consciously [3].

In the era of big data, unstructured information is its most significant adjustment, while the processing of things, data query and organization are all in the development stage, and various new technologies are constantly emerging, which can create good conditions to some extent. To better apply inquiry-based teaching methods. With the help of existing network resources, students are exposed to the most cutting-edge database knowledge, which helps to significantly enhance the motivation for learning. Since the birth of the Internet, it has greatly changed people's daily work, study and life. Non-professional students can help them learn professional knowledge better by studying this knowledge [4].

4. Design and Implementation of Inquiry Teaching Method Based on Big Data Database Course

4.1 Determining the Inquiry Content of Database Courses
The characteristics of big data are mainly large-scale data, fast data circulation, dynamic data system, diverse data types, and huge data value, including how to obtain, organize, store, and process data. Therefore, on the technical system, it can be divided into multiple aspects, that is, collection and preprocessing, analysis and mining, storage and management, visual computing, and security, etc., and the application of big data in many fields, such as information services, finance, manufacturing, smart cities, scientific research, and international security.

The teaching content of database courses based on big data mainly includes four aspects, namely data representation, data modeling and query corresponding to data representation forms, database design patterns and transaction processing. Its specific content covers many aspects of knowledge content, such as basic knowledge: basic concepts related to database systems, data modeling, designing relational databases, and processing related affairs. Exploratory knowledge: data representation (files, drawings, etc.), Key-value, Document and other corresponding data modeling methods; carefully analyze the mainstream NOSQL database, and perform transactional processing on CAP theory; MapReduce calculation model.

4.2 Designing Experimental Content
The database course is based on the experimental content in the context of big data, including how to establish a database system experiment environment with Hadoop as the core, and carefully organize query experiments and database association experiments. First, the basic experiment: how to install, start and use a commercial database management system; the database can be created using data definition commands in SQL; to better understand the transaction concepts in data access, you can take full advantage of interactive SQL; Authorize management and verification of databases; focus on developing small database applications. Second, exploratory experiments: based on Hadoop when
setting up an experimental environment; in order to promote the implementation of single-table and multi-table associations, the MapReduce model needs to be fully utilized; a NOSQL database can be established for data query and practice [5]

Take exploratory experiments as an example to make a detailed introduction. (1) Task description: Enter two files, namely the factory table (factory name column, address number column), and the representative address table (address name column, number column). To find the correspondence between factory name and address name, you need to carefully analyze the input data and output the factory name-address name table. (2) Experiment purpose: This experiment is helpful for mastering the multi-table association method. By processing the original data scientifically, the core information can be mined out to ensure the realization of the natural connection function in the database. (3) Experimental process and analysis: The analysis of this example requires a combination of multiple tables. It is mainly connected with the left column addressed column and the right table addressID column. In the connection result, the two columns to be connected need to be removed to obtain the result. Required results table. The solution of this example mainly relies on MapReduce. First of all, we need to focus on how to join tables naturally, secondly, set the connection columns scientifically, and finally we need to pay attention to collating the results. The Shuffle process based on MapReduce will prevent and control the same key value together, so you can set the key value of the map result to the columns to be joined, and then naturally join the same values in the columns. Therefore, after the read data is divided into factayyname and addressed in the map stage, they are set to value and key respectively for output and used as the left table. On this basis, the addressID and addressed of another table are divided and set to key and value is output and used as the right table. Then, the connection needs to be completed during the shuffle process. Reduce the connection needs can achieve the acceptance of the connection result. There is a factayyname and addressed relationship in the value-list of each key. The value-list of each key is taken out for serious analysis and can be analyzed separately. Put the factayyname and addressed of the left and right tables in the two arrays, and the final result is the Cartesian product of the two arrays. (4) Experimental implementation: Map and Reduce process source code. (5) Experimental summary: A serious and systematic summary of the experimental implementation process [6].

4.3 Explore and Solve Problems
For one thing, it is committed to the continuous optimization of basic knowledge teaching and in-class experiments in the teaching content; carefully selected inquiry-type knowledge and experiments, and conducted a careful explanation to guide students to master specific learning methods. For another thing, in the process of guiding students to carry out autonomous learning, they focus on the detailed inquiry-type knowledge points, with the help of network resources, to conduct in-depth exploration of relevant inquiry knowledge, mainly in the form of small papers. In the design and completion of experimental tasks, combined with detailed inquiry experimental content, and then in-depth analysis and promotion of experimental tasks. With rich network resources, this work can be better carried out, and experiments are carefully designed and completed with the help of exploratory experiment content. For non-professional students, it is necessary to focus on cultivating students with certain abilities in the learning process. In order to better ensure that big data is integrated with their respective professional knowledge, they need to make full use of network resources and master certain information processing capabilities.

4.4 Knowledge Building
Regarding the construction of its own knowledge architecture, it needs to be combined with the exploratory knowledge that has been collected and organized. After discussion and research, teachers and students not only supplement their own knowledge systems, but also they can ensure that a complete structure can be formed in the context of big data, and then complete practical teaching tasks, such as graduation design [7].

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5. Assessment and Evaluation of Database Course Inquiry Teaching Method

5.1 Determining Assessment Indicators for Teaching Effectiveness
Based on the perspective of the teacher, in order to obtain the ideal teaching effect, it is necessary to determine various assessment indicators, to ensure that the inquiry-based teaching model can be effectively and effectively promoted into actual teaching, and to ensure that the formed educational materials are more complete, such as syllabuses, teaching materials, exercise books and instruction books. From the perspective of students, the content of inquiry teaching and experiment can be expressed more intuitively in the form of a dissertation or project.

5.2 Actively Promote the Effect of Inquiry Teaching
Based on the background of big data, it has unparalleled advantages to implement the inquiry teaching method into the teaching of database courses. It can organically integrate the basic theory, engineering practice, and experimental teaching of the database to help students learn more comprehensively about database knowledge. In this way, with the help of network technology, students can effectively access relevant information, ensuring that students' ability to form can have big data computing thinking and cognition, better adapt to and promote social development. The reality is that the school teaching does not meet the needs of the company. After entering the society, graduates will experience various discomforts and even anxiety. To this end, they need to make scientific and reasonable adjustments from the perspective of talent training. As a new teaching method, inquiry-based teaching is relatively reasonable. It can organically combine the needs between schools and enterprises to a certain extent, and truly cultivate high-skilled and high-quality comprehensive talents for the healthy and long-term development of enterprises. 8]

6. Conclusion
For big data, that is, for data collections that exceed the acquisition, storage, analysis, and management capabilities of conventional database tools, MapReduce is currently most widely used in the industry. This is a relatively common big data computing model, which is characterized by: "Single input and two phases." Nowadays, China's society and economy have achieved rapid development, and the level of science and technology has continued to improve. We have entered the era of big data, and the process of informationization is accelerating, which has greatly expanded the scope of big data applications. At the same time, the arrival of big data has greatly changed people's data processing methods and development technologies. In order to make better changes, it is necessary to fully apply big data technologies in actual teaching, and to continuously optimize the existing database teaching methods. Inquiry teaching methods are better promoted and applied to teaching to ensure that the formed knowledge system is more systematic and complete. In addition, in the actual teaching process, teachers need to scientifically guide students on how to effectively apply the most advanced design methods and development tools, combined with the actual situation of the enterprise, committed to the cultivation of high-quality talents.

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