

# Research and exploration of access database course teaching mode based on data management thinking

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**Abstract:** with the continuous improvement and development of information technology, the thinking of data management has been applied to all fields of society. The change of social needs puts forward new requirements for the general education of computing in Colleges and universities. According to the course teaching goal of cultivating students' thinking ability of data management, this paper analyzes the practical problems in the current situation of access database course teaching, Combined with SPOC teaching mode, this paper studies and explores the hybrid teaching mode of the course, and gives the corresponding teaching measures and assessment methods.

**Keywords:** SPOC; Access; teaching model

## 1. Preface

SPOC (small private online course) is sponsored by Armand of the University of California, Berkeley Professor fox first proposed that the course adopts a hybrid teaching mode combining online and offline. Students must ensure learning time and intensity, be able to participate in online discussions, and complete the required assignments, examinations and other learning tasks. In recent years, many well-known universities in the world have carried out the reform of mixed teaching mode based on SPOC by using high-quality online teaching resources. For example, the University of California at Berkeley has conducted SPOC Hybrid Teaching Practice on its "cloud computing and software engineering" course, which has been highly praised in many aspects. Harvard University has opened a number of SPOC course experimental teaching on its online teaching platform. Learners have completed the specified learning tasks and granted corresponding certificates by applying for assessment. At present, domestic colleges and universities have tried to reform the SPOC teaching mode of various courses in various disciplines by using online teaching resources such as MOOC and smart tree, and achieved good teaching results.

## 2. Analysis of the current situation of access course teaching

With the continuous development and improvement of research results in the field of computer science, data management technology has been widely used in various fields of society. The demand for computers in all sectors of society is constantly changing, making the current training goal of computer general education gradually change from the previous "Research on basic computer knowledge" to "computer application", or even "Application of computers". Therefore, the current ability training goal of computer general education should change from the cultivation of students' information processing ability to the cultivation of data thinking ability, which is a huge challenge for computer general education in Colleges and universities. The sixth edition of college computer teaching requirements for liberal arts majors in Colleges and universities published by the Steering Committee for basic computer teaching in Colleges and universities of the Ministry of education clearly states that: "The teaching goal of university computer general education is not only to strengthen the basic knowledge and application skills, but also to cultivate students' thinking and ability to solve and handle problems with computers, understand the role of computers in the process of problem solving, show the thinking mode of computer science, and improve their innovation and Practice ability." In the third part "curriculum system and content" of "teaching requirements", it is clearly stipulated that database programming belongs to the core course of public computer courses in Colleges and universities.

Access database course is a compulsory course of general education for liberal arts majors in our school. It is a public basic course that systematically introduces database knowledge and has strong practicality. The course aims to cultivate students' data management thinking and data processing ability. However, in many years of teaching practice, it has been found that there are some problems, such as the single teaching situation, the uneven foundation of students, the lack of interaction between teachers and students in the teaching process, the lack of subjectivity in students' learning, and the low learning efficiency. Relying on SPOC teaching mode to design the teaching process of access database course can diversify the teaching forms, effectively improve students' autonomous learning ability, enhance the interaction between teachers and students, and effectively improve the teaching effect of the course.

## 3. Design of teaching mode based on SPOC

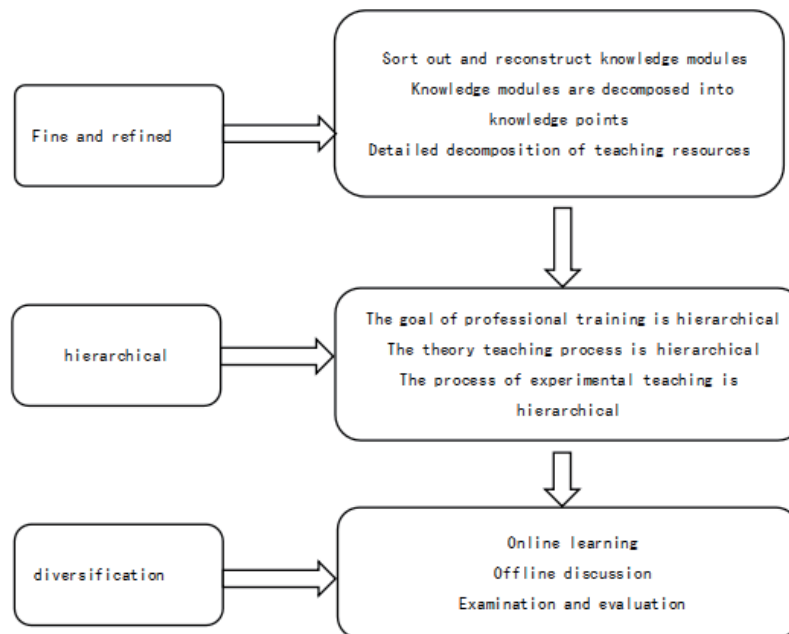
Combined with the ability training objectives of the access database course, the core knowledge module is determined, and the teaching content is reorganized based on the SPOC teaching mode. The teaching process is refined, hierarchical and diversified, and the data management thinking is established from the teaching of core knowledge points, striving to transform the traditional knowledge teaching mode into the thinking teaching mode. The teaching mode design is shown in Figure 1.

### 3.1 Refinement of teaching content

Sort out the core teaching content involved in the course and establish the core teaching content of data management thinking. Guided by the thinking of data management, it selects, balances, reconstructs and decomposes the teaching content in a refined way to form refined teaching resources, including teaching videos, courseware, case sets, test question banks and so on, forming fragmented knowledge points,

which are collected through the campus superstar network teaching platform, so that students can use all kinds of teaching resources for learning anytime and anywhere, Transform knowledge transfer into thinking transfer.

For example, the core knowledge modules of the access database course include relational terms, relational operations, data types, field properties, functions, operators, and so on. In the process of designing the teaching content, we can refine the relational term module into nine related knowledge points, such as relationship, field, tuple, domain, main keyword, external keyword, entity integrity, reference integrity and user-defined integrity. Each knowledge point is designed through teaching micro video and short courseware, With the help of case set and test question bank, the mastery degree of knowledge points is verified to form a closed-loop process of learning verification establishing thinking.



**Figure 1 design of teaching mode**

### 3.2 Hierarchical teaching process

#### 3.2.1 Hierarchy of professional training objectives

According to the different professional ability training objectives of the course, we should reasonably set the course access conditions, form different types of small-scale teaching classes, flexibly adjust the teaching methods and teaching contents, and ensure the effectiveness of teaching by providing high-quality teaching services and flexible and efficient learning methods for students of different majors, so as to achieve good teaching effect.

For example, management majors should focus on strengthening the thinking of data storage, data processing, data statistics and analysis; Education and foreign language majors should focus on strengthening the use of database tools; Medical majors should focus on strengthening the training of programming thinking ability and data processing ability.

#### 3.2.2 Hierarchical theory teaching process

Based on the flipped classroom teaching process, the theoretical teaching process is divided into four levels: offline preview, classroom problem driven, teacher-student joint demonstration, and teacher summary. After class, students watch the course videos or courseware for preliminary basic knowledge learning. In class, teachers no longer teach all the teaching contents of the course, but put forward solutions in a problem driven way. Both teachers and students demonstrate the feasibility of the solutions, and finally the teachers summarize them.

For example, data query is one of the core knowledge modules in database. In class, teachers can introduce data query cases related to majors. First, students design the query method, and then teachers and students jointly verify whether the method is feasible and realize the query, and verify whether the query results are correct. Finally, teachers summarize the design of the query method. For the same query requirement, we can also propose a variety of design methods to implement one by one and verify its advantages and disadvantages.

#### 3.2.3 Hierarchical experimental teaching process

According to the course ability training objectives, the experimental teaching process is designed into three parts: confirmatory experiment, design experiment and research exploratory experiment. In the part of confirmatory experiments, we focus on the mastery of students' basic knowledge and skills, design experiments on the application ability of students' knowledge and skills, and exploratory experiments on the innovation ability of students. The implementation difficulty of each level of experiment increases gradually, so as to gradually achieve the ability training goal of establishing data management thinking.

### 3.3 Diversification of teaching assessment

Through multi link and multi angle comprehensive evaluation, students are urged to actively participate in various teaching links, and

teachers adjust teaching strategies in time according to the evaluation results to enhance teaching pertinence. In this course, the evaluation system is divided into three parts: online learning, offline discussion and examination score evaluation. Make a detailed record of the listening, operation, classroom questions and discussions of the offline learning part, and evaluate the performance. Pre study, after-school homework and after-school exercises of online learning are evaluated through superstar network teaching platform.

The comprehensive curriculum evaluation system can objectively, impartially and comprehensively reflect the learning effect of students, and guide students to continuously, actively and high-quality complete the teaching tasks of each link. The evaluation results of each teaching link can be used as the basis for subsequent teaching strategy adjustment to continuously improve the teaching quality and effect.

#### 4. conclusion

The adoption of SPOC teaching mode can help improve teachers' teaching enthusiasm, enable teachers to flexibly adjust teaching content, effectively organize offline teaching and fully demonstrate teaching skills according to their understanding of teaching content and analysis of students' situation. At the same time, it can free teachers from repeated course teaching, and put more energy and time into organizing teaching activities, so that teachers can truly become the instructors, promoters and controllers of teaching. SPOC teaching mode can expand the time and space of classroom teaching, diversify teaching resources, supplement traditional teaching materials with rich content of network teaching resources by virtue of the openness of network teaching platform, abandon the traditional teaching mode of Teacher centered, emphasizing knowledge impartment and taking students as the object of knowledge inculcation, so as to be student-centered, give full play to students' initiatives Enthusiasm and innovative spirit, improve students' learning interest and teaching effect, and effectively realize the thinking teaching of the current knowledge. The implementation of SPOC teaching mode can provide a good reference for the teaching research and reform of other computer general education courses in schools, and provide the necessary reference for improving the effect of public computer teaching in schools.

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