

Exploration on Course Design of Database Principle and Application Under the Background of New Science

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Abstract: Aiming at the problems of outdated topic selection of database curriculum design, divorced from reality, lack of enthusiasm for cultivating students' innovation ability and active learning, based on the analysis of the current situation of comprehensive practical teaching of database curriculum design, this paper puts forward the reform strategy of database curriculum design under the background of new engineering, and through the in-depth cooperation between schools and enterprises, from the aspects of topic selection of curriculum design This paper expounds the reform measures of curriculum design teaching from the selection of curriculum design content to examination and evaluation, and gives the results of curriculum design reform.

Keywords: New Science; Database; Curriculum Design; School Enterprise Cooperation

1. Problems in database course design

At present, the database curriculum design is generally designed by teachers to draw up 10-15 topics, allowing students to choose a topic from them, and there are also groups to choose topics. The selection of groups is relatively random^[1-3]. Students complete the design and development of the system according to the requirements of teachers.

Problems in database course design: (1) the topic is too old, which is not conducive to the training of students' professional positions. Students are familiar with the topic and easy to design, but in today's information age, the proposed topic should be close to the actual situation and the professional position. At the same time, the topic is old. The topic more than ten years ago is still in use, and even several topics continue to be used, such as the student status management system, the library management system, etc., and the proposed topic can be downloaded to the relevant system on the network, which is not conducive to giving full play to students' initiative to explore and learn knowledge. (2) It is not conducive to the cultivation of team spirit. Team spirit is one of the most important qualities of modern enterprises. Any project needs collective strength to complete, especially the development of large projects. When grouping, teachers should take into account the actual situation of students, such as personality, specialty, classroom performance, knowledge mastery, etc., and reasonably organize groups, preferably 2-3 people. It is not allowed for students to organize by themselves, which often fails to achieve the effect of group organization, making some students unable to really participate in the course design. (3) The curriculum design is seriously divorced from the actual project. In the actual project development, there is a lack of project demand research, and the demand analysis is completely disconnected from the real project, which is not conducive to the cultivation of students' professional ability.

2. Database course design based on school-enterprise cooperation

The training goal of application-oriented undergraduate colleges and universities is mainly to cultivate high-quality application-oriented engineering talents with strong practical ability that are suitable for the market demand and close to the professional positions of enterprises.

2.1 Database course design needs the deep participation of enterprises

Today, with the rapid development of information technology, all walks of life are inseparable from information management^[4]. Database technology is indispensable and widely used. The deep participation of enterprises needs the support of school policies. After all, enterprises are profit-oriented and production-oriented. On this premise, both parties plan the content of the course design and give appropriate topics, knowledge points to be examined, objectives to be achieved in the course design, and assessment methods. The enterprise mentor will participate in the whole course design and provide real-time guidance, so that students' participation and enthusiasm will be high, and the effect of the course design will be more obvious.

2.2 Database course design requires students to do a good job in the early topic analysis)

When explaining the course design, professional teachers and enterprise tutors should not only explain the theoretical knowledge of the database, but also explain the application of the database in practice. Students like to listen to professional "stories". These "stories" make students interested, eager for knowledge, curious about new technology, and will have continuous exploration methods and actions, School and enterprise professionals should constantly explore the projects and topics of comprehensive application of students' professional knowledge in practical teaching design, and tell professional "stories" well.

From demand analysis → conceptual structure design → logical structure design → database physical design → database operation and maintenance, the main tasks of each stage should be clear, which will have a good effect on database design.

Database design requires certain paradigms, the first and second paradigms^[5]. These concepts are very abstract, which is a headache for many students to learn database. But this part is also a very important part. The key to learning is to grasp the data dependency to distinguish various paradigms, and to understand that the ultimate purpose of changing various paradigms is to optimize the database, In addition, it is better to apply various concepts to practical examples to help learning.

2.3 Reform of assessment methods

The assessment method should be scientific and reasonable. It should examine all links of student curriculum design. It should not see whether the system function is completed to meet the design requirements. It should see whether the design content is "available", and also verify whether it is "real". It should use the life-cycle model of software engineering to assess the relevant links of student curriculum design, design the defense link with the corporate tutor, and each member of the team should divide the tasks in the project The roles in the project and the tasks completed are stated one by one, and the judges score one by one according to the pre-designed scoring criteria, so as to effectively test the students' ability to comprehensively use the professional knowledge they have learned. The proportion of assessment methods is shown in Table 1.

Table 1 Proportion of course design assessment

| process assessment (60%) | | result assessment (40%) | | |
|--------------------------|---------------------------|--|-----------|--------------------------------|
| daily attendance | Completion of phased work | Completion of system functions (group defense score) | team work | Project Document Specification |
| 10% | 50% | 15% | 10% | 15% |

On the basis of Table 1, the final evaluation of the results is subdivided into the indicators in Table 2, and the curriculum design instructors and enterprise engineers comprehensively evaluate the effect of the curriculum design based on the indicators in Table 2. It not only avoids that the evaluation index is too coarse, which is not conducive to scientific

evaluation of students' achievements, but also makes excellent works more in line with the evaluation criteria. Let every student know how they have completed the course design through the indicators.

Table 2 Comprehensive Evaluation of Course Design Achievements

| items | evaluating indicator | Score | grade |
|------------------------|-------------------------------|-------|-------|
| Design content | Difficulty | 50 | |
| | workload | | |
| | Excellent degree | | |
| | Innovation awareness | | |
| Document Specification | standard | 15 | |
| | Relatively standard | | |
| | Non-standard | | |
| Personal performance | attendances | 20 | |
| | Team work | | |
| | Independent design capability | | |
| | Literature review | | |
| Team defense | PPT production | 15 | |
| | Design introduction | | |
| | Function demonstration | | |
| | question answering | | |
| total | | 100 | |

3. Some Thoughts on Curriculum Design Teaching

The curriculum plan uses the information layout of the teaching space, including multimedia, for teaching and learning^[6]. In terms of teaching methods, the course adopts the way of knowledge points and technology points (in the form of lectures), and intersperses multiple incentive points that arouse students' interest, that is, what is seen and heard that is closely related to daily life, and analyzes the deep meaning of database principles from the outside to the inside, so that students can understand the rational nature of things through practical operation and related demonstration of perceptual phenomena, while avoiding students falling into the trap of dull and difficult to understand principles and concepts.

3.1 The acquisition of new knowledge can promote database technology

While using the course learning resources reasonably and effectively, you can learn the ideas and experiences of others to solve problems through the network, including forums and post bars, and timely acquire and master the latest knowledge in the database field. In the information society, the knowledge ability is updated rapidly. Only by constantly learning new knowledge can you keep the technology you learn up with the development of the times.

3.2 Combining relevant languages to operate the database is conducive to practical operation

The database system is highly operational. Hands-on practice is an effective way to master the basic operation of the database^[7]. Combining with relevant languages, such as Java, can better experience the actual functions brought by the database. The AWT library and SWING library in Java, as the knowledge of operating the database interface, can exercise the Java language well and also carry out the actual operation of the database knowledge. Generally, the more projects they participate in, the richer their work experience will be. In the face of complex problems, they can also better solve them according to the actual experience of database operation.

3.3 The mastery of theoretical knowledge is easier to solve practical problems in operation

The study of theoretical knowledge is boring and difficult to master. Database theoretical knowledge is the basis for learning database well^[8]. Without a solid theoretical basis, database technical problems encountered in work can not be well solved. For example, when learning database theory, you will learn E-R diagram, database design principles and other knowledge, which is relatively boring and difficult to master. If you do not understand these knowledge, it is difficult to independently design a good database and table. We can combine theory with practice to learn, which will be more efficient.

4. Teaching effectiveness

Through the database course design of in-depth cooperation between schools and enterprises, students have higher enthusiasm and participation, and the design and optimization of works' functions and interfaces have been significantly improved, and there are many innovative works. The express information management system for students majoring in the 2019 Internet of Things Engineering who simulate the logistics business is very close to the enterprise's professional position. The team has fully investigated the functions of the express information management system for the logistics business, and has completely designed the features of fast query and fast processing of express documents. It is an excellent course project designed to be close to the market. The students of this group also showed the printing interface function during the defense, which added highlights to the project.

Express delivery has become a part of daily life. The topic selection and ideas are novel, and very close to reality and in line with actual needs. It can be seen that school-enterprise cooperation has better promoted students' thinking and research, and stimulated students' interest in learning.

Another group of students in 2019 designed a drug management system, which fully considered the daily drug store's drug management, skillfully integrated the Java language GUI part with the MY SQL database knowledge, and conducted a field survey on the management of drug warehousing, query, and delivery, and wrote a detailed demand specification, many process tools that do not understand, such as Gantt chart, timing chart PAL and other knowledge went to the library to borrow books on UML modeling, continued to study and explore, and finally submitted a specification of requirements.

5. Conclusion

In the context of the new engineering discipline, we should cultivate the talents needed by the industry with the output as the orientation, and take the engineering ability training as the goal. The teaching process should always reflect the teaching idea of "students as the main body and teachers as the leading role". The ultimate goal of students' learning knowledge is to be able to apply what they have learned to practice. School-enterprise cooperation is an effective way to improve students' hands-on practical ability. Both sides should not only reflect the needs of professional positions, but also present professional comprehensive ability in terms of curriculum design content, process assessment and evaluation, and should also put the improvement of students' independent design ability and cooperation ability in an important position to strengthen the practicality of theoretical teaching, To lay a solid foundation for students' future practice and work.

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