# Research on the Teaching Design of Higher Vocational 'Database Principles and Applications' Course Based on the Cultivation of New Quality Talents

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*Abstract:* In order to satisfy the demands of new quality productivity, the strategic aim of production and education integration must be strengthened, new standards for vocational education must be met, and creative talent must be jointly developed. "Principle and Application of Database" is a required course for computer majors in higher vocational colleges. It will help students master the design techniques, procedures, and real-world examples of database application systems, as well as gain a deeper understanding of the evolution of database management technology and set a strong foundation for their future professional development. Investigating the "Principle and Application of Database" course's teaching strategy at higher vocational institutions is very important as it focuses on developing fresh, high-caliber talent. It pierces the notion of new quality talent training, refines the course design, develops students' capacity for practical application, and ADAPTS to the need of the society for high-caliber database talents.

*Keywords:* New quality personnel training; Database principle and application course; Higher vocational education; Teaching design; Application ability

## 1. Issues raised

### 1.1 Cultivation of new talents

The driving force behind innovative, high-quality productivity is knowledge-driven, science- and technology-led, and emphasizes the critical role that innovation plays in productivity growth[1]. The creation and growth of new productive forces rely on the assistance of highly competent individuals, and the development of vocational education is necessary to support such individuals. Regarding this, the reform and innovation of the personnel training mode in vocational education to produce more new types of workers is the key to accelerating the development of new productivity [2].

### 1.2 Course Analysis

Higher vocational institutions and universities require computer science students to take Database Principles and Applications as a basic subject. The knowledge of the course "Principles and Applications of Databases" has four characteristics: strong comprehensiveness, strong practicality, strong frontiers, and strong practicality [3]. Students who successfully complete this course will be able to build and manage database systems, operate and maintain databases using SQL language, and grasp the fundamental concepts and application techniques of databases. Students can also comprehend database technology's development trend and application potential at the same time, providing a strong basis for future professional growth.

### 1.3 Instructional design

The foundation of the teaching process is instructional design, which is vital to raising the caliber of instruction and enhancing student learning objectives. According to Mr. He Kexiang, traditional instructional design typically entails the following: establishing the learning objectives; analyzing learner characteristics; establishing the content of the instruction based on the objectives; analyzing the beginning of instruction based on the content of the instruction and the characteristics of the learners; developing the teaching strategies; choosing and creating the teaching media in accordance with the objectives and the content; and conducting the evaluation of the instruction [4]. To guarantee the ongoing enhancement and optimization of the instructional design, the aforementioned seven processes can interact with one another and be

repeated again.

### 1.4 Problem statement

In order to better integrate the theory into the application, not only to penetrate the concept of integration of industry and education from the past, but also to achieve the consolidation of integration of industry and education, and collaborate to cultivate innovative talents adapted to the needs of the new quality of productive forces. As a first-line higher vocational teacher, we need to constantly update, optimize and iterate our own teaching design methods and strategies, adhere to the actual starting point, specific analysis of specific problems, and effectively implement the concept of new quality talent cultivation into the actual curriculum, and consolidate the talent foundation for the development of new quality productivity by cultivating high-quality skilled personnel.

## 2. Clarify the new quality talent training objectives

### 2.1 Enterprise quality database talent standards

Through the school enterprise cooperation model and the construction of employment internship bases, it reflects that enterprises have the following requirements for database talents: technical ability, rich experience, communication skills, innovation ability, teamwork, and sense of responsibility.

### 2.2 Course Teaching Objectives

Knowledge Objective: Students will be able to utilize SQL language and database design tools with ease, as well as comprehend the fundamental ideas, principles, and design techniques of databases. They will also get an understanding of the history and present state of the database system. The skill objective is for students to be able to design, create, maintain, and administer databases, as well as to be able to autonomously finish the design and implementation of small-scale databases. They will also be able to apply database technology to address real-world issues. The ability objective is for students to be able to work well in teams, communicate effectively, be innovative, actively participate in team discussions, offer insightful ideas and solutions, and exhibit a certain level of professionalism and professional ethics.

### 2.3 Cultivation Objectives of New Quality Talents

New quality talent cultivation goal is essentially, theoretically, the enterprise quality talent standards, course teaching objectives of both, the advantage of maximising, one cannot do without the other. On the basis of completing the teaching objectives of the curriculum, cultivating students who meet the standard of enterprise quality talents is the core essence of the new quality talent cultivation objectives. In this paper, Hainan University of Science and Technology, College of Information Engineering, Software Engineering Technology, professional 'database principles and applications' course human resources ERP system and database application course of school-enterprise cooperation case as an example, to explore the new quality of talent cultivation based on higher vocational 'database principles and applications' course teaching design.

## 3. Teaching design

### 3.1 Determination of teaching objectives

through the HR ERP case study, students will be able to understand and practise how to integrate the knowledge of the database application course with the actual business needs to develop a customised HR ERP system for an enterprise through university-enterprise cooperation.

### 3.2 Analysing learner characteristics

At present, there are five aspects to analyze the learning characteristics of vocational college students: clear goals: I hope to improve my professional competitiveness and increase employment opportunities by studying database principles and applications. Practical ability: I hope to apply the database knowledge I have learned to practical projects to enhance my hands-on skills and practical experience. Different students have different differences in knowledge background, learning style, and learning motivation.

### 3.3 Determine the teaching content based on the teaching objectives

Based on the teaching objectives, the teaching content mainly includes the following seven parts: requirements analysis and design, database design, programming and application development, system testing and optimization, teamwork, project management, communication and reporting.

### 3.4 Teaching starting points based on content and learner profiling

Requirements understanding and interpretation: students need to effectively understand business requirements and translate them into system design, which may require communication with students unfamiliar with the business domain. database complexity: database design can be quite complex and students will need to master complex relational modelling and query writing. project management: ensuring that the project stays on schedule, managing resources and solving problems can be a challenge. practical project risks: working with real businesses

can introduce risks such as changes in requirements, time constraints and business changes. technology tools: students may need to master specific programming languages and development tools, which may be new and challenging for some students. Integration skills: Integrating knowledge and skills from multiple areas such as database applications, programming, requirements analysis, and project management may be challenging for students.

### 3.5 Teaching Strategies

There are various teaching strategies, mainly including classroom teaching, training room teaching, online learning platforms, teamwork projects, case analysis, practical projects, audience lectures, feedback, and evaluation. By applying teaching strategies, the optimization of teaching effectiveness can be achieved.

### 3.6 Selection and design of teaching environment based on teaching objectives and content

The teaching environment mainly includes database management systems, programming tools, online learning platforms, project management tools, cloud computing platforms, ERP simulation software, and online collaboration tools. Based on the teaching objectives and content selection, determine the design of the teaching environment to achieve the optimization of teaching objectives and content.

### 3.7 Teaching and learning evaluation

The quality of project implementation for student teams: requirements analysis and design quality, data migration quality, system development and configuration quality, system testing quality, user training quality, system deployment and maintenance quality. Students' teamwork and communication skills: teamwork ability, communication skills, cooperative spirit, leadership ability. Students' personal reflection and report: course learning experience, including the combination of theory and practice, the importance of teamwork, and understanding of enterprises; Learning gains, mastering basic knowledge of human resources ERP, improving analytical skills, and teamwork abilities.

## 4. Summary and Reflection

In conclusion, developing curricula that integrates the teaching of Database Principles and Applications with the concept of cultivating new quality talent is a long-term task. It also entails understanding the internal logic and fundamental requirements of this concept, putting the fundamentals of industry-teaching integration into practice throughout the entire teaching process, and raising the caliber of talent in accordance with the demands of newly developed productivity.[5]

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## References

[1] Xi Jinping. Grasp the important mission of the Northeast and write a new chapter for the comprehensive revitalisation of the Northeast [N]. People's Daily, 2023- 09- 10(001).

[2] ZHANG Zhiyong, LU Jian, GAO Key, et al. Research on the cultivation path of new quality productivity skills talents - 'wisdom +' iterative upgrade of higher vocational talent training system[J]. Sichuan Water Resources, 2024, 45(02):195-198.

[3] Yang Yan. Exploring the teaching design of Database Principles and Applications in higher vocational colleges and universities[C]// Hong Kong New Century Culture Publishing House.2023 Proceedings of the Sixth International Symposium on Intelligent Education and Artificial Intelligence Development (Volume II).Sichuan Culture and Media Vocational College;, 2023:4.DOI:10.26914/c.cnkihy.2023.073736.

[4] He Kexiang. Constructivist teaching model, teaching method and instructional design[J]. Journal of Beijing Normal University (Social Science Edition), 1997, (05):74-81.Z

[5] Dong Wenjing Research and Practice on Teaching Methods of "Database Principles and Applications" [J]. Science and Technology Economic Market, 2021, (04): 116-117

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