# Research on the Teaching Mode of Oracle Database Course in Application-Oriented Universities

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*Abstract*—**This paper studies the reform of Oracle Database course in terms of teaching philosophy, teaching content, teaching methods, and assessment methods. By optimizing teaching content, using a variety of teaching methods, adopting diversified assessment methods, etc., to enhance students' interest in learning, improve students' practical operation ability and application development ability, better complete the teaching objectives of Oracle Database courses, and greatly improve teaching quality.**

*Index Terms*—**Applied undergraduate; Oracle teaching; Teaching mode**

## I. INTRODUCTION

Applied undergraduate education shoulders the mission of cultivating senior technical talents, and teaching should pay attention to the practicality and application of basic theories and professional knowledge, so as to cultivate talents with strong ability to solve practical problems. Database technology is the most important technology in computer science and information science, which has been widely used in data management, administrative management, e-commerce, artificial intelligence, industrial production and manufacturing, computer-aided design and other fields, and has become the core technology and foundation of information management system for organizing and managing a large amount of data in the information society. As the most popular large-scale relational database system, Oracle database system has strong data storage and management capabilities, good scalability and stability, high security and reliability, etc., occupying more than 70% of the database market. With the current level of informatization, the demand for Oracle database developers has also increased significantly. Therefore, how to cultivate Oracle database application developers that meet the needs of society has become an important issue facing the current application-oriented undergraduate education.

At present, in the teaching mode of Oracle database courses, colleges and universities generally have problems such as emphasizing theory over practice, teaching materials over students, and knowledge over ability, resulting in many students finding it difficult to meet the needs of enterprises for database talents when they are employed. Therefore, the research on the reform of Oracle Database course teaching

mode under the application-oriented talent training model is of great significance.

## II. COURSE BACKGROUND ANALYSIS

In the application-oriented talent training mode, Oracle database course aims to cultivate the ability to solve complex engineering problems, occupies an important position in the curriculum system of computer-related majors, course teaching should follow the principle of "theory supports practice, practical service application, application reflects innovation", and lays a solid system design and development foundation for system development, project management, project training, graduation internship and design.

1) Problems in the traditional teaching mode

In the traditional Oracle course teaching, whether it is teaching mode, teaching method, teaching content, teaching evaluation, etc., it is seriously decoupled from the needs of students. The outstanding problems are that theory cannot be linked with practice, students learn passively, individual needs are suppressed, assessment methods are too simple, and skills are emphasized over political and ideological education. Therefore, to carry out Oracle curriculum reform, it is necessary to improve students' comprehensive quality and practical innovation ability as the reform concept, adhere to the student-centered teaching method, integrate professional curriculum education, innovation and entrepreneurship education, rely on information technology to carry out smart teaching, and redesign the teaching mode, teaching method, teaching content, and teaching evaluation.

2) Key issues that need to be addressed

(1) Break the traditional boundaries of curriculum setting, carry out a high degree of integration of theory and practice, and improve students' operational ability.

(2) Guide students to move from "knowledge learning" to "knowledge application" to improve students' ability to solve complex engineering problems.

(3) Based on the concept of student-centered, set teaching goals, optimize teaching mode, improve course evaluation mechanism, and make the entire curriculum system more reasonable and perfect.

(4) Carry out comprehensive curriculum reform based on professional characteristics and curriculum knowledge points, and improve engineering students' humanities and

social science literacy, engineering professional ethics and sense of social responsibility.

### III. REFORM OF CURRICULUM TEACHING MODE

(1) Clarify the teaching philosophy

1) Establish a teacher-led and student-oriented teaching philosophy. Effective teaching organization helps students complete learning tasks efficiently and acquire operational skills. The leading role of teachers is mainly reflected in the design of classroom teaching content and the application of teaching methods and classroom guidance. Student agency emphasizes students' initiative and autonomy in learning. Encourage students to speak actively and boldly, understand students' understanding of issues, and create an atmosphere of free discussion.

2) Abandon the traditional thinking of emphasizing theory over practice, and pay attention to the combination of theory and practice. First of all, the content selection closely follows the development of Oracle database technology, and the case can be expanded appropriately in addition to the syllabus. The teaching organically combines theory and practice, so that students can master basic theoretical knowledge, basic operation methods, database management and maintenance, and be able to use Oracle database technology and a language for database system development and design.

(2) Positioning teaching objectives

Oracle Database courses are typically mid-to-late in specialized courses and are more application-focused. Therefore, the teaching content, teaching process, teaching methods, etc. of the course should closely focus on the central goal of improving students' practical ability. The purpose of teaching design is to analyze and discover the problems in the teaching process, design solutions and test the effectiveness of solutions through teaching practice, so that the teaching process can be gradually improved, and then improve the quality of teaching. According to the characteristics of students' learning and the needs of curriculum reform, set three-dimensional teaching objectives: in terms of knowledge and skills, students have a deeper understanding and understanding of Oracle system and related knowledge, and fully practice the theoretical knowledge of database system principles and application courses; In terms of process and methodology, students are equipped with Oracle database management and development capabilities, and can carry out information system management and software development; In terms of emotional attitudes and values, students are required to have professional qualities in software system development and information management, and have correct morals and values. [7] discussed about a Secure system to Anonymous Blacklisting. The secure system adds a layer of accountability to any publicly known anonymizing network is proposed. Servers can blacklist misbehaving users while maintaining their privacy and this system shows that how these properties can be attained in a way that is practical, efficient, and sensitive to the needs of both users and services. This work will increase the mainstream acceptance of anonymizing networks such as Tor, which has, thus far, been

completely blocked by several services because of users who abuse their anonymity. In future the Nymble system can be extended to support Subnet-based blocking. If a user can obtain multiple addresses, then nymble-based and regular IP-address blocking not supported. In such a situation subnet-based blocking is used. Other resources include email addresses, client puzzles and e-cash, can be used, which could provide more privacy. The system can also enhanced by supporting for varying time periods. [8] discussed about creating Obstacles to Screened networks. In today's technological world, millions of individuals are subject to privacy threats. Companies are hired not only to watch what you visit online, but to infiltrate the information and send advertising based on your browsing history. People set up accounts for facebook, enter bank and credit card information to various websites. Those concerned about Internet privacy often cite a number of privacy risks events that can compromise privacy which may be encountered through Internet use. These methods of compromise can range from the gathering of statistics on users, to more malicious acts such as the spreading of spyware and various forms of bugs (software errors) exploitation.

(3) Optimize teaching content

1) According to the syllabus to sort out the knowledge points, determine the teaching focus and difficulties, select suitable cases for explanation and training, not only to achieve the purpose of mastering the knowledge points, but also to be practical, mobilize students' enthusiasm. Common content can be briefly introduced, and the content arrangement focuses on characteristics. At the same time, grasp the difficulty of the case, so that students can achieve phased results through certain efforts, enhance the sense of learning achievement, and then motivate themselves to devote themselves to learning with greater enthusiasm.

2) On the basis of traditional teaching content, adjust the experimental class and theoretical class time according to students' learning and feedback, and increase the proportion of experimental class time. Appropriate adjustments shall be made to the teaching content and teaching sequence.

3) Arrange project development tasks and complete them in the form of group division of labor. Through project development, students can learn more about and master the connection and use of various development languages and Oracle databases.

(4) Use a variety of teaching methods

In order to achieve the expected teaching effect, a variety of teaching methods can be used comprehensively. Inquiry-based learning is carried out through heuristic, discussion-based, project-driven and other methods, guiding students to actively participate in discussion, integrate into classroom teaching, and mobilize students' enthusiasm and initiative in learning.

1) Project-driven pedagogy. Project-driven pedagogy is derived from constructivist learning theory, where teachers and students discuss and research together to complete a specific project. Specifically, it is required to carefully organize the content of experiments and integrate practical cases into teaching. The content of each chapter is divided

into several learning situations, and the project development task is decomposed into gradually progressive sub-tasks according to the principle of simple to complex, easy before difficult, so that students can master the necessary knowledge and skills in the process of completing each sub-task.

2) Case scenario pedagogy. The teaching of traditional engineering courses is generally based on textbooks as a reference and is carried out by chapter. The knowledge points of Oracle courses are huge and complex, and the connection between chapters is not close. The new teaching mode is based on the explanation of core knowledge, guided by the development of corresponding ability goals, task-driven case teaching as a means, and consolidated by practical questions and answers. Therefore, in the teaching activities, a complete and simulated production and life background should be introduced, the entry of knowledge points is in the form of scenes, and the design problems and solutions are typical problems encountered by developers in the enterprise in actual work and the required solution strategies. Through situational teaching training, students can not only acquire the knowledge and skills required to use Oracle Database in a real production environment, but also enable students to understand the actual scenarios of future careers, so that their learning goals are clear and targeted, reflecting the concept of student-centered, teachers making good use of strategies such as demonstration, diagnosis, evaluation, feedback and constructive intervention to guide and assist students to achieve expected results.

3) Case pedagogy. Case teaching is an open, interactive approach to teaching. Instruct students to read cases in advance and organize discussions. Case teaching should be combined with relevant theories, and achieve the purpose of enlightening theory and enlightening thinking through the collision of various information, knowledge, experience and views. In the teaching process, each relatively independent operation can be broken down into several cases. In addition, some content or knowledge points are more cumbersome operation steps, students often do not have very clear thinking, can not master the specific operation steps, will not operate on the computer. To do this, the lesson can be recorded using screen recording software, or in the form of notes, and the teacher will distribute the operation steps to students for review. Some students' demonstrations can be spot-checked, and repeated explanations and demonstrations for the problems that arise can strengthen the teaching effect, so that students can truly grasp the knowledge points and improve their practical ability.

(5) Innovate the teaching model

1) A model that combines theory and practice. Oracle Database course is a highly operational and practical course, so the traditional teaching mode should be changed, the theoretical course and experimental course should be merged, the classroom should be changed to the computer room, and the teaching mode of learning and operation should be adopted to improve learning efficiency. In order to improve students' mastery of knowledge, the curriculum teaching is carried out in the way of teaching and experimentation, so that the theoretical knowledge points and experimental

operations correspond to each other, improve the problem of the connection between theoretical teaching and experimental teaching, and truly realize the connection between theory and practice. Through this class mode, it not only ensures the fair distribution of educational resources, but also greatly improves students' learning self-discipline, and the learning effect is greatly improved.

2) Knowledge system direction selection. In the traditional teaching process, teachers often pursue the "many, fast and complete" knowledge content imparting, ignoring the "refined, practical and accurate" mastery of knowledge points, students have no right to choose knowledge, completely passive learning, and personalized needs are suppressed. The new teaching mode should formulate personalized assessment levels according to the individual differences of each student, and conduct assessments in a timely manner, so as to accurately grasp the learning status of students and make timely corrections to teaching. The new teaching mode should abandon the unified teaching method, divide the knowledge system into directions, divide the learning process into stages, divide students into levels, and cross-correspond with direction-stage-level, respect students' individual selection needs, and make them learn what they need, what they learn and what they learn is useful. According to the different application directions of Oracle, students can choose one or some of them to focus on learning according to their future planning and application preferences, and other directions to assist understanding.

(6) Cultivate team spirit

Form a project team, elect a team leader, and assume the role of project manager. When grouping, consider the different student bases, and rationally allocate them on the basis of free combination, so that each student can improve their ability through team and project learning. The end-of-semester assessment can take the form of submitting course projects to cultivate students' knowledge application ability, team consciousness and collaboration spirit through team learning. At the same time, the teaching method of small cases in the classroom and large projects in the semester is adopted, and the student team masters the correct solution to the problem under the guidance of the teacher; In the process of interacting with peers, team members can experience the actual project development process, enhance team awareness, train collaborative communication skills, and cultivate professional quality; In ordinary classroom discussions, you can also work in small groups to exert initiative and cultivate the ability of independent learning.

(7) Reform of assessment methods

The traditional written examination assessment method cannot meet the teaching requirements of Oracle courses, so the traditional "single" assessment method should be changed, the teaching process should be integrated by placing equal emphasis on goals and processes, and a flexible scoring mechanism with multiple angles and dimensions should be set up to assess students' learning status by stage, level, and in various ways and means. The assessment consists of several parts: the final examination is conducted by computer-based examination; The usual grades include

periodic tests, team assignments, and classroom assessments, among which the course assessment is divided into various forms of classroom tests, program acceptance, and summary reports, and each assessment method is not completed at one time, but gradually carried out with the penetration of knowledge points in the teaching process. Through this three-dimensional assessment method, students can be evaluated more comprehensively and objectively for their learning effectiveness, on the one hand, students are required to pay attention to the accumulation of ordinary learning, do not rely on final exam results to barely pass, on the other hand, through team work to exercise teamwork ability.

## IV. CONCLUSION

Oracle database technology has been advancing, and society's requirements for database development and database managers are gradually increasing. This paper reforms and explores the teaching philosophy, teaching content, teaching methods, and assessment methods of Oracle Database courses. Through optimizing teaching content, rationally using cases and other teaching methods, we connect the knowledge points of teaching materials and adopt diversified assessment methods to improve students' practical operation ability and comprehensive application ability to develop application capabilities using Oracle database knowledge. Teaching practice shows that the comprehensive use of the new teaching mode can better complete the teaching objectives of Oracle Database course. The application of the new teaching mode greatly enhances students' interest in learning, helps students master the operation and management skills of Oracle database, and also exercises students' teamwork ability and project development ability. Curriculum teaching reform is a process of continuous improvement and optimization, and application-oriented undergraduate colleges and universities also need to continue to improve according to students' learning results and continue to explore more scientific and reasonable teaching models.

REFERENCES

[1] WANG Li, XU Mengyu, WANG Guangwen. Teaching practice of Oracle course based on OCA certification [J]. Electronic Technology, 2021, 50(10):112-113.
[2] FENG Yanru, PAN Zhi'an, JIA Qinqin, et al. Differentiated teaching practice of Oracle database oriented by talent training goals [J]. Education and Teaching Forum, 2019(10): 136-137.
[3] ZHANG Huiying, ZHU Honghao. Research and practice of Oracle database teaching reform [J]. Journal of Jiamusi Vocational College, 2018(12): 400-401.
[4] ZHOU Lifan. Application of flipped classroom in Oracle database course [J]. Education and Teaching Forum, 2018(39): 97-98.
[5] WANG Fang, LI Peng. Research on ORACLE curriculum teaching reform based on CPC model [J]. Journal of East China University of Technology (Social Science Edition), 2017, 36(03): 272-275.
[6] YU Kangjuan. Application analysis of project pedagogy in Oracle database teaching [J]. Computer Knowledge and Technology, 2021, 17(24): 239-240.
[7] Christo Ananth, A.Regina Mary, V.Poornima, M.Mariammal, N.Persis Saro Bell, "Secure system to Anonymous Blacklisting", International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST), Volume 1,Issue 4,July 2015,pp:6-9
[8] Christo Ananth, P.Muppidathi, S.Muthuselvi, P.Mathumitha, M.Mohaideen Fathima, M.Muthulakshmi, "Creating Obstacles to Screened networks", International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST), Volume 1,Issue 4,July 2015, pp:10-14

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