

Research on Innovative Practice Based on Online and Offline Blended Teaching

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Abstract—Aiming at the current teaching pain points of outdated teaching content, traditional teaching mode, lack of ideological and political elements, and simple assessment methods, this paper reshapes the teaching content based on the OBE concept, constructs a "2+3" hybrid teaching mode based on MOOC and SPOC, innovates teaching methods, strengthens ideological and political integration, and adopts diversified grade evaluation. Curriculum innovation enhances students' abilities, enlivens students' innovative thinking, and improves the quality of teaching.

Index Terms—Teaching innovation, blended teaching model, curriculum ideology and politics

I. INTRODUCTION

Do not forget the original intention, keep in mind the mission of the teacher, and take every class well. People-oriented, from the perspective of classroom subject-student, do a good job in teaching knowledge. With the purpose of innovation, teaching reform and curriculum ideology and politics as the means, we are committed to creating a new type of classroom. Databases and their related technologies are a rapidly developing and widely used field of computer applications. With the rapid development of information technology such as the Internet of Things, mobile Internet, and social media, data resources have expanded sharply, and how to solve the relevant theoretical and technical problems of data management, and use computers to scientifically organize, store, retrieve, maintain and share these data resources, is the main teaching content of database principles and application courses. This course is a professional basic course of information and computing science, learning this course, you can understand and master advanced data management technology, and can be applied to the relevant links or fields that require data management. The content learned in the course will be closely related to the subsequent professional course learning.

II. PROBLEMS IN TRADITIONAL TEACHING

(1) The teaching content is outdated

This course is highly theoretical and has many hours, and the traditional theoretical teaching content is abstract and outdated, which cannot meet the needs of students in enterprise positions. Teaching and experiments are separated, and the degree of integration of knowledge and actual engineering cases is not high, and students cannot experience

the fun of "applying what they have learned".

(2) Traditional teaching mode

In the traditional teaching mode, the teacher-oriented teaching method is adopted, that is, the way of teacher knowledge granting, the lecture is full of lectures, and the students are in a subordinate position in the classroom, passively accepting and absorbing knowledge, and the main position is not obvious. Teaching methods and means are backward, and there is little interaction between teachers and students, which is difficult to stimulate students' interest and initiative in learning.

(3) Lack of ideological and political elements

In the traditional teaching process, teachers pay attention to knowledge transfer and professional skill training, excavate less ideological and political elements contained in the curriculum, do not guide students deeply enough, students cannot see the deep connotation behind technology, and the educational effect of professional courses is not obvious.

(4) The assessment method is simple

The traditional course grade assessment is composed of ordinary grades and final examination results, and ordinary grades are mainly evaluated by attendance, homework, laboratory reports, etc., and the proportion of final examinations is high. The assessment method emphasizes the result over the process, the challenge is insufficient, the process assessment is not easy to measure, and the traditional assessment method is no longer applicable.

III. PEDAGOGICAL INNOVATIONS

(1) Reshape teaching content

According to the characteristics of online learning and cognitive rules, the course breaks the chapter restrictions, reshapes the content according to the case of teaching management system, and refines it into 63 knowledge points and eight theoretical modules: Oracle Database Foundation, SQL language, lock and table partitioning, database objects, PL/SQL language, cursors, subprocedures and packages, triggers; Eight experimental modules: Teaching Management System Database Installation, Unloading and Configuration, Table Creation and Data Query, Application of Functions and Table Partitioning, Application of Database Objects, Application of Control Structure, Application of Cursors, Application of Sub-processes, Application of Triggers.

(2) Innovative teaching methods

1) Group discussion

According to the learning situation of students in the MOOC platform, the learning situation is analyzed, and the

group discussion content is set up on the wisdom tree SPOC platform, and the students communicate, discuss, and learn in small groups after class, and the code of the group is explained and displayed in small groups in class. It strengthens students' teamwork ability, independent learning ability, communication and expression ability, and cognitive exploration ability. [7] examined the development and refinement of possible mathematical models for the intellectual system of career guidance. Mathematical modeling of knowledge expression in the career guidance system, Combined method of eliminating uncertainties, Chris-Naylor method in the expert information system of career guidance, Shortliff and Buchanan model in the expert information system of career guidance and Dempster-Schafer in the expert information system of career guidance method has been studied. The algorithms of the above methods have been developed. The set of hypotheses in the expert system is the basic structure of the system that determines the set of possible decisions of the expert system. This set, which is crucial in decision-making, should be sufficiently complete to describe all the possible consequences of situations that arise in the subject area. Therefore, it is important to improve the mathematical models of the intellectual system of career guidance. [8] discussed that according to the observations in this paper, an existing mathematical model of banking capital dynamics should be tweaked. First-order ordinary differential equations with a "predator-pray" structure make up the model, and the indicators are competitive. Numerical realisations of the model are required to account for three distinct sets of initial parameter values. It is demonstrated that a wide range of banking capital dynamics can be produced by altering the starting parameters. One of the three options is selected, and the other two are eliminated. The model is generalized taking into account fractional derivatives of the bank indicators for time, reflecting the rate of their change. Based on numerical calculations, it is established that reduction of the order of derivatives from units leads to a delay of banking capital dynamics. It is shown, that the less the order of derivatives from the unit, the more delay of dynamics of indicators. In all analyzed variants indicators at large times reach their equilibrium values.

2) Problem pedagogy

Raise case questions online to test the effect of online learning; Offline, with "problems" as clues, through the way of problem guidance, students are led to review the important content in MOOCs, guide students to explore knowledge, and improve students' thinking ability and problem-solving ability.

3) Interactive pedagogy

Through the interactive Q&A of the Smart Tree platform online, students and teachers exchange and explore knowledge; Offline methods such as student lecture evaluation, on-site grading, and preemptive answer submission are used to strengthen interaction in class, stimulate students' interest in learning, and improve their attention in classroom learning.

(3) Innovative classroom organization and implementation

The curriculum is student-centered, learning outcomes-oriented. The "three-step method" is used before, during and after class.

1) Before class: MOOC combined with SPOC

a. Online self-study + self-test exercises

Team teachers have launched a shared lesson of this course on the provincial alliance platform, and students can use the fragmented time to learn videos and self-test exercises on the MOOC platform to cultivate independent learning ability. Teachers can grasp the progress of students from the background.

b. Academic situation analysis + benchmarking data

The SPOC platform is: Smart Tree Platform.

According to the learning situation of MOOC middle school students, teachers analyze the learning situation, find out their knowledge weaknesses, and publish benchmarking materials in the SPOC space in the school to strengthen students' consolidation of weak points.

c. Breakout sessions + online Q&A

Teachers post case-based breakout discussions in the SPOC space, and students can discuss in small groups, and can answer questions and answers online with teachers and classmates at any time.

2) In class: flipped classroom, theory and practice are carried out simultaneously

Students bring laptops and conduct flipped classrooms that combine learning and practice in the smart classroom.

a. Classroom introduction + knowledge review

According to the online learning situation, teachers conduct classroom introduction, use the method of guided questions to review online important knowledge, further grasp students' learning, and consolidate important knowledge.

b. Student lecture and student evaluation + in-depth guidance

For the discussion content published online, the group display and student evaluation are carried out in the form of student lectures and student evaluation. Students use their mobile phones to mark groups on the spot and assess their grades. Students cultivate teamwork, communication, intellectual exploration and honest and fair work ethic.

According to the learning situation of students in the classroom, teachers guide students to explore knowledge, guide students to carry out deep learning, and students' master knowledge in application.

c. Practical practice + ideological and political scientific research

For theoretical knowledge, teachers give practical problems, students use laptops to write code, scan the code to answer and submit, give score rewards to the top five students who submit, and ask the first place to explain the code to test the learning results in project practice. For the experimental content, it is for the online experimental design, and the experimental debugging and optimization are completed in the class, which improves the students' hands-on ability.

In the teaching process, teachers deeply explore the educational elements of professional knowledge and guide

students to integrate classroom knowledge into scientific research.

- 3) After class: consolidate and improve
 - a. SPOC Releases

Combined with the classroom learning situation, the SPOC platform arranges online learning tasks and group discussion content of the next course, assigns benchmarking homework, consolidates classroom knowledge, and cultivates students' ability to use knowledge to solve problems.

- b. Online discussions

Through the online platform, online discussion and communication on difficult problems can be carried out to solve problems and consolidate knowledge.

- c. Improvement of scientific and technological innovation

According to the classroom content, cutting-edge materials and related papers are released in the SPOC space on campus, and students with strong learning skills are guided to carry out science and technology innovation incubation projects, so as to improve students' hands-on ability and scientific innovation ability.

- (4) Strengthen ideological and political integration

Most of the teaching objects of this course are the only children of the "post-00s", who grew up in the era of the prosperity and development of the Internet, greatly influenced by family, society and the Internet, active thinking, wide knowledge, weak sense of reality, outstanding personality, and easy to accept new things and new views. In view of these characteristics of students, in the process of integrating ideological and political content into curriculum teaching, according to the content conditions, flexibly adopt different ways to increase the guidance and discussion of ideological and political aspects, combined with the events around them, use the familiar language and interest of students to seamlessly connect ideological and political education into teaching, so that students can resonate cognitively, emotionally and behaviorally. In the teaching process, the content that is too political is transformed into real case discussions, and the national spirit is promoted in the transfer of knowledge, so as to promote knowledge and ability with ideology and politics, and promote the improvement of the overall teaching effect.

- (6) Multiple grade assessment

This course adopts diversified and quantifiable assessment to assess students, focusing on process-based assessment.

- 1) Online assessment

Online learning in the shared course "Database Principles and Applications (Oracle)" of the online open classroom platform of provincial colleges and universities, online classroom learning accounts for 10% of the total course assessment, including online learning average score, online chapter test and online exam, which is calculated by the platform. Project unit tests account for 10% of the total assessment of the course. The question type is a comprehensive programming question, which is organized by the teacher during and at the end of the semester according to the content learned, mainly to assess students' analytical and problem-solving ability and programming ability. Homework accounts for 10% of the total assessment of the course.

- 2) Offline assessment

Classroom performance accounts for 10% of the total assessment of courses, mainly including: group display, group member supplementation, group comments, and classroom answers. Among them: group display, group member supplementation, and each group evaluation session will be scored by students on the spot according to the 100-point system. Mid-term assessment accounts for 10% of the total assessment of the course, and is graded by the teacher according to the grading criteria. The experiment accounts for 10% of the total proportion of the course assessment, and the experiment report is made according to the experimental requirements and the correct operation results are obtained, and the total score of the experiment is the average score of each experimental score. The final examination accounts for 40% of the total assessment of the course, and adopts the form of closed-book written examination, including multiple-choice questions, judgment questions, writing out running result questions, completing program questions, and programming questions, comprehensively testing students' mastery of the course.

IV. CONCLUSION

After years of innovative exploration and practice, the innovative teaching mode combining online and offline has realized the transformation from traditional classroom to smart classroom, knowledge classroom to ability classroom, indoctrination classroom to practical classroom, closed classroom to open classroom, greatly improved students' comprehensive ability, and significantly improved the teaching level of teachers, and achieved very significant teaching results. In the future, the research on teaching strategies should be further explored.

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