

Research on the Implementation Approach of the Course Construction of Safety Principle Based on OBE Model

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Abstract: OBE (Outcome-Based Education) is a student-centered education model, which lays stress on the cultivation of students' learning achievements and abilities. This paper discusses how to make use of OBE Model to implement teaching reform in colleges and universities by taking the course construction of "Safety Principle" as an example. This paper first introduces the fundamental concepts and characteristics of OBE Model, then analyzes the teaching goals and students' needs of the course "Safety Principle", and proposes the principles and approaches of course design. Finally, the effect of curriculum reform is assessed and summarized, and it is concluded that the application of OBE Model can effectively improve the students' learning effect and ability and achieve the teaching goal.

Keywords: OBE Model; Safety Principle; Teaching Reform; Learning Achievement; Student Ability

1. Introduction

With the quick development of economic globalization and information technology, talent cultivation has become an important mission of higher education. However, the traditional educational pattern often lays stress on the teaching of knowledge and memory, ignoring the actual needs of students and the cultivation of their abilities. The undergraduate major of safety engineering started to enroll students in 2010. In accordance with the cultivating scheme and teaching program formulated previously, the first teaching of the course Safety Principle was conducted in autumn of 2011. In the past over ten years, the teaching program of the course was revised for 4 times, and the textbooks were changed for 3 times. There were 4 teachers who had implemented the teaching mission of this

course successively, fundamentally forming the teaching program with OBE education concept as the core and safety principle (the third edition) (the 13th Five-Year Plan textbook for ordinary higher education) as the core textbook. The curriculum teaching group is composed of 3 main course teachers. The student-centered OBE education pattern is adopted; Focus on the development of students' learning achievements and abilities. After years of exploration, some experience has been accumulated. However, in today's society where students acquire more and more diversified information channels, the value orientation in the teaching process is more important. Therefore, it is necessary to research the implementation approach and effect of OBE Model in the course construction, so as to promote the quality of talent cultivation^[1,2].

2. Fundamental Concepts and Characteristics of OBE Model

OBE (Outcome-Based Education) pattern is a student-centered education pattern, which lays stress on the cultivation of students' learning achievements and abilities. It is no longer the traditional teacher-centered teaching approach. It focuses on the cultivation of students' learning achievements and abilities. It takes the students' learning as the main line, takes the students' needs and interests as the guidance, and takes the students' development and practice as the purpose^[3-5]. The characteristics of OBE Model mainly include the following aspects:

(1) Student-centered. The core of OBE Model is student-centered, focuses on the cultivation of students' learning achievement and ability, takes students' needs and interests as guidance, and takes students' development and practice as the purpose.

(2) Learning achievement-oriented. The goal of OBE Model is to cultivate students' learning

achievement and ability, lay stress on students' practical application ability and innovation ability, and take students' learning achievement as the assessment criterion.

(3) Take practice as the main line. In the teaching process of OBE Model, students' practical ability and practical application ability are emphasized.

(4) Assessment oriented. The evaluation of OBE Model is on the basis of the students' learning achievement and ability, takes the students' practical application ability and innovation ability as the assessment criterion, and focuses on the scientific nature and objectivity of the assessment.

3. Teaching Objectives and Students' Needs in the Course Construction of Safety Principle

Safety Principle is a required major course for safety engineering undergraduate education in each university, and is also a professional fundamental theory for students to learn other professional courses, expand professional knowledge and deal with scientific research and production work of this major [6,7]. By means of conducting the research of this course, on the basis of mastering the safety principle, students can establish correct safety concept guide and implement scientific research, study and work on the scope of safety with correct safety approaches, and implement the guideline of "safety first, prevention first" in the work, laying a solid foundation for the study of subsequent professional courses [8-10]. Students can master the following aspects by means of study:

(1) Master the fundamental concepts of safety principles, and conduct simple analysis on the fundamental knowledge of accident types and preventive measures in different industries.

(2) Learn and master the accident cause theory, human error and unsafe conduct, whether to prevent human error and unsafe conduct, enterprise safety management, safety regulations and safety management system, and modern safety management and other contents related to safety knowledge and safety principles.

(3) Master the fundamental accident types in different industry, and provide theoretical basis for entering the society and dealing with related work in the future.

In accordance with the needs of students and

the teaching goal of Safety Principle, the characteristics of OBE Model fit this mode adopted to conduct curriculum design and teaching reform.

4. Principles and Approaches of Curriculum Design

On the basis of the problems mentioned above and in combination with the actual situation of our university, the research projects' group has constructed the teaching pattern of "1+3' four-in-one" on the basis of OBE Model, namely, "one platform" + "three-layer design": Superstar Fanya "integrated intelligent teaching platform", teaching resource design, teaching approach design and assessment pattern design.

4.1 Teaching Content Construction of "Integrated Intelligent Teaching Platform"

Since the spring semester of 2019, in order to adapt to the change of the education pattern in the information era, the research projects' group has tried the domestic renowned online education network platforms such as "rain classroom", "treenity" and "Superstar Fanya", etc. After collecting the feedback opinions of teachers and students, in combination with the actual situation of our university, "Superstar Fanya" and "integrated intelligent teaching platform" are selected as the main online teaching platform. This platform is the intelligent learning platform provided by Superstar Company, with the cloud network teaching platform as the center, containing the whole process of daily teaching before, during and after class, integrating the classroom end, a mobile end and management end of various teaching applications shall be integrated. "It highly integrates all resources inside and outside the university, supports the whole teaching process such as course establishment, content sharing, learning process tracking and control, online test and assignment release, communication and interaction, performance assessment and learning achievement feedback, thus completing supporting flip classroom teaching, mixed teaching and innovative classroom, and realizing the deep integration of information technology and teaching process." Since the platform was selected, the course of Safety Principle has finished 3 complete teaching cycles on the platform, with 235 students selecting courses in total, 39

teaching resources uploaded in total, 207 interactive messages published, 147 test questions set up and 3 online tests completed, fully guaranteeing the convenience and continuance of students' selection, study and unified management of teachers.

4.2 Perfect Teaching Resources and Enrich Teaching Cases

In the course of curriculum construction, the research projects' group shall strengthen the reorganization and integration of curriculum in accordance with the requirements of professional cultivating objectives and cultivating specifications, realize the overall optimization of curriculum content and structure; insist on the principle of coordinated development of imparting knowledge, cultivating ability and improving quality, properly deal with the relationship between theory and practice, teaching and learning, and focuses on the cultivation of practice and innovation ability. The teachers of the research projects' group concentrated on the collection and sorting of teaching materials, teaching program, teaching courseware, experimental teaching materials, reference books and other course teaching resources, and converted the corresponding formats and uploaded them to the online education platform, which largely facilitated the learning of students; secondly, they shared numerous accident cases and investigation reports, and shared numerous of classic accident cases and investigation reports required by the safety major to the students for reference, which has huge practical significance and strongly promoted the improvement of teaching quality; Unpatriotically organize teachers to take part in training, convenient for teachers to study and communicate, and the teaching level of teachers is improved.

4.3 Enhance Issue-driven and Improve Participation

Through the feedback of the students of the course Safety Principle in our university, it is found that the interactive teaching approaches such as the case inquiry approach can effectively improve the students' learning interest and participation. The feedback results indicated that students' interest in learning was significantly improved under the guidance of watching accident cases and teachers'

questions. In accordance with this situation, the research projects' group adopted the case inquiry approach in the classroom teaching practice. The specific approach is: the teacher selects the typical accident case related to the course content in advance, and proposes the questions for the case, and then lets the students watch the case videos or pictures, etc., and thinks with the questions, and finally the teacher asks the students questions and sums up the teaching knowledge points. This teaching approach strengthens the leading role of students, and changes from passive learning to active learning. It can stimulate students' creative thinking and largely improve their interest in learning. At the same time, it is also conducive to adjust the classroom atmosphere, so that students better engaged in learning. In addition, the research projects' group also adopts the teaching pattern of "group discussion + group report + teacher comment". Specifically, the students are divided into three to five groups, who take turns as group leaders. After each group discussion, the group leaders report, and the other group leaders can express different opinions. The teacher will only comment and sum up. This interactive teaching pattern, taking students as the main body, also well realizes the consolidation and mastery of knowledge.

4.4 Perfect Multi-assessment and Highlight Application Assessment

With the change of teaching pattern, the examination approach of safety principle should be adjusted accordingly. On the basis of the requirements of our university's application-oriented talents positioning, the research projects' group adopts the multi-assessment approach of "process assessment + Course paper assignments+mid-term examination + final examination". Among them, the process assessment such as attendance and questioning accounts for 30%, the Course paper assignments and the mid-term examination account for 10% respectively, and the final assessment accounts for 50%. The process assessment includes attendance, questioning, assignments and other activities. The questions of the mid-term examination and the final examination are on the basis of the principles of high-order, less memorization mechanically, more comprehension and application, focusing on the comprehensive

application of the curriculum knowledge. By means of conducting the above multi-assessment approach, highlight the assessment of application-oriented knowledge points.

5. Assessment and Summary of the Effect of Curriculum Reform

Since the implementation of OBE Model for curriculum reform, the survey of teachers and students' satisfaction indicates that it can effectively improve the students' learning effect and ability and achieve the teaching goal. In the teaching practice of the course construction of Safety Principle, the OBE Model is adopted to implement the course design and teaching reform, and good results are acquired. The specific performances are as follows: (1) The students' learning interest and participation are obviously improved. By means of case teaching, experiment teaching and interactive teaching, students' learning interest and participation are enhanced, and students' learning effect and ability are improved. (2) Students' practical ability and practical application ability are obviously improved. By means of practical teaching and practical teaching, we can enhance students' practical ability and practical application ability, and lay a solid foundation for students' professional development. (3) the teaching effect and quality are obviously improved. Course design and teaching reform are implemented by means of OBE Model to improve teaching effect and quality and achieve teaching goal.

6. Conclusion

To sum up, OBE Model is a student-centered education pattern, which lays stress on the cultivation of students' learning achievements and abilities. The use of OBE Model in curriculum design and teaching reform can effectively improve the students' learning effect and ability and achieve the teaching goal. In the teaching practice of the course design of Safety Principle, the OBE Model is adopted to implement the course design and teaching reform, and good results are acquired.

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