

# Research on Curriculum Teaching Reform and Practice Based on OBE Concept - Taking the Course of "Urban Rail Transit Operation Organization" as an Example



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**Abstract:** In order to implement the implementation plan of China's higher vocational education reform and strengthen the skill cultivation of vocational students, this article adopts the teaching philosophy of "student-centered, output oriented, and continuous improvement" to reform and practice the curriculum organization, curriculum content, teaching methods, and curriculum evaluation. The teaching objectives support the specification of talent cultivation, the teaching content aligns with the job requirements of enterprise positions, the teaching methods reflect student-centered, the assessment and evaluation focus on the combination of process evaluation, professional literacy and ideological and political evaluation, and the achievement of course objectives. It not only focuses on students' understanding of theoretical knowledge, but also emphasizes the training of practical skills, and emphasizes the cultivation of students' quality. Practice has proven that this method effectively enhances students' awareness of autonomous learning and significantly improves teaching effectiveness.

**Keywords:** OBE concept; Teaching reform; Higher vocational colleges

## Introduction

China's higher vocational education should draw on the advantages of international higher vocational education, deepen the reform of talent cultivation models, improve the quality of technical and skilled talent cultivation, and actively promote high-quality development (Cao, 2020). OBE (Output Based Education) is an educational model based on learning output, with a learner centered and result oriented educational philosophy (Zhao et al, 2020). The goal of implementing teaching content is the learning outcomes that students achieve through learning. This concept was proposed in the basic education reforms in the United States and Australia. In 1981, American scholar Spotty proposed the

educational philosophy of OBE in his book <Results Based Education: Disputes and Answers>. He defined OBE as "clearly focusing and organizing the education system around experiences that ensure students' substantial success in future life" (Wang et al, 2018). With the development of teaching philosophy, the OBE concept was quickly accepted and promoted by people, and has now been fully adopted by many countries for engineering education professional certification, becoming the mainstream concept of education reform in countries such as the United States, the United Kingdom, and Canada (Zhang & Wang, 2021). The common expression of OBE by domestic scholars is result oriented education, and there are also references to "ability oriented education", "demand oriented education", or "goal

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oriented education". The OBE concept is a "student-centered" educational philosophy that focuses on cultivating students' abilities and abilities after receiving education. It emphasizes that all educational activities, processes, teaching, and curriculum design must revolve around achieving learning outcomes for students. In practice, OBE is an educational model that focuses on educational output (Tian et al, 2020). The three core elements of the OBE concept are: firstly, student-centered. The goals of educational and teaching activities should be set around the growth needs of students, and the teaching syllabus should be designed based on the expectations of students (Liu, 2018). The principle of judging whether teachers and other supporting conditions are conducive to students achieving the expected goals is to comprehensively evaluate students' performance. All resource investment and teaching processes are aimed at helping students achieve better learning outcomes. Secondly, guided by student outcomes. The OBE concept believes that the ultimate goal of education is to help all students acquire work and life skills, and to carry out a series of teaching activities around these skills (Wang & Chen, 2020). The OBE concept clarifies the reasons for enabling students to achieve learning outcomes, identifies the means used to assist students in achieving these outcomes, confirms whether students have achieved these outcomes, and safeguards for their ability to achieve them. Thirdly, focus on continuous improvement. The OBE concept requires the evaluation of training objectives, teaching processes, and graduation requirements, and the evaluation results are used to improve the training objectives, teaching processes, and graduation requirements (Gu et al, 2016). Taking adaptation to change as the benchmark for quality improvement, systems and standards reflect the content of continuous improvement. The effect of continuous improvement is reflected through student performance, forming a virtuous cycle that promotes sustainable improvement (Gao et al,

2021).

## 1. Background of Course Implementation

The course 'Urban Rail Transit Operation Organization' is the core course of the urban rail transit operation management major, which mainly cultivates the professional qualities and skills of urban rail transit operation duty officers, operation dispatchers, yard dispatchers, station attendants, and train drivers. Students are required to master the basic theories and methods of train operation organization in rail transit, and pay more attention to the cultivation of dispatch and command ability and team collaboration ability in the process of train operation organization. Based on previous teaching experience, it was found that there are shortcomings in the teaching implementation process, such as: (1) the curriculum follows the proposed curriculum standards, implements the teaching process according to the designed lesson plan and teaching calendar, and neglects the goal of "output oriented"; (2) Teachers combine theory with practice in the teaching process, pay attention to the cultivation of theoretical and practical abilities, and neglect the cultivation of students' ideological qualities; (3) The evaluation of course goal achievement is relatively extensive and inaccurate.

In this context, the members of the course team, guided by the evaluation concept, strengthen the accuracy of course positioning, reorganize course objectives, accurately benchmark talent cultivation requirements, optimize course resources, deepen course content and enterprise job standards and skill appraisal standards, organize teaching using production projects and typical work tasks as carriers, construct a comprehensive evaluation mechanism that combines process and result evaluation, and emphasize the integration of process evaluation and ideological and political element evaluation;

## 2 Curriculum Reform Based on OBE Concept

### 2.1 Overall design based on OBE concept

The OBE concept emphasizes student-centered, learning outcomes oriented, and evaluates the quality of professional talent cultivation by comparing professional core technical abilities and quality requirements. This educational philosophy focuses on what students "learn" and "can do", rather than just what teachers "teach". By conducting research with enterprises, we aim to understand the demand for skilled and high-quality talents in relevant positions, determine professional talent training goals, clarify professional training requirements, formulate corresponding course teaching objectives based on talent training requirements, design course teaching content based on the teaching objectives of the course, implement corresponding teaching content according to each objective of the course, and ultimately calculate the degree of achievement of course objectives and evaluate teaching results, and continuously improve.

### **2.1.1 Scientifically determining course objectives**

The curriculum objectives embody the basic concept of output orientation, with the cultivation of students' professional literacy and abilities as the core, accurately aligning with the professional talent training specifications, reasonably setting the curriculum objective content and target points, establishing the connection between the curriculum objectives and training specifications, making the curriculum objective content teachable, learnable, and evaluable; The expected learning outcomes of the knowledge, abilities, and literacy expressed in the course objectives can be understood and recognized by stakeholders.

### **2.1.2 Carefully designed course content**

The teaching content is aligned with the professional standards of enterprise positions. The setting of teaching content is to conduct in-depth analysis of job tasks, and design teaching modules based on typical job tasks and work processes; The content of each module is aligned with the occupational standards and skill appraisal standards of enterprise positions, embedded in

enterprise rules and regulations, operation standards, safety regulations, on-site operation videos, work cases, skill competitions for operation and management positions, and assessment requirements for the "1+X" level certificate of station professional skills. Integrate ideological and political elements such as corporate job standards and corporate culture into every teaching project content.

The teaching content is linked to the actual production situation. The course content is closely integrated with the current development of urban rail transit technology, incorporating new industry technologies such as 5G technology, facial recognition, equipment self inspection, digital twins, unmanned driving, intelligent inspection, and other advanced technologies, and incorporating new industry standards such as the "Management Measures for Urban Rail Transit Train Organization". In order to closely connect with the actual production situation, the college will regularly arrange students to engage in on-the-job practice in rail related enterprises, understand the advanced technology and job standards on the production site, and fully explore the practical teaching content in the teaching content, utilizing the college's training base to carry out practical teaching activities.

Integrating ideological and political education into teaching content. This course requires the ability to organize and coordinate the operation of urban rail transit stations and depots, as well as the ability to organize and carry out console monitoring and operation, train reception and departure, and construction operation organization. By sorting out the teaching content of the professional course, combining the characteristics, thinking methods, and value concepts of the course "Urban Rail Transit Operation Organization", we deeply explore the ideological and political elements of the course, and organically integrate them into the course teaching.

Construct course teaching resources. In order to meet the teaching requirements of the course

content, the course team teachers carried out reform and construction of the course. Through enterprise research and combined with the job requirements of the enterprise, they compiled the "Urban Rail Transit Operation Organization" textbook and enterprise case library, forming the "Urban Rail Transit Operation Standardization Operation Training Manual". The course team teachers integrated teaching resources and built a high-quality online open course "Urban Rail Transit Operation Organization" using the Xueyin online platform. This course utilizes a wealth of information technology tools, with 2580 elective students and a total of 6772 interactions, resulting in a total of 1.32 million page views. This course has recorded a total of 44 teaching videos, with a total duration of 371 minutes. There are a total of 79 course resources, 1592 quizzes and homework exercises, 518 exam question banks, and 56 non video resources.

### **2.1.3 Effective implementation of teaching content**

In recent years, with the release of policies and the development of social economy and industry enterprises, the content of this course has undergone two major updates and adjustments. One is to integrate ideological and political content into the curriculum, and cultivate students' noble moral character. Facing the new formats and new needs of the urban rail transit industry, the team proposed the ideological and political concept of "making a strong country have me" courses, fully explored the ideological and political elements of the courses in the majors and posts, built an online learning platform, used "Internet plus" textbooks, and an on campus and off campus practice teaching base, forming a comprehensive ideological and political education system of courses. In order to better integrate the ideological and political content of the course into students' learning careers, we have extended the ideological and political content of the course both internally and externally. We have established urban rail transit associations, held rail culture festivals,

volunteer service teams, party building red bases, science popularization bases, and social practice projects in rural areas with professional characteristics of rail transit, and guided excellent values into knowledge transmission and ability cultivation, helping students shape correct worldviews, life views Values.

The second is to introduce the concept of "integration of job courses, competition and certification", and reconstruct the teaching content of the course. The course teaching content combines the assessment content of job positions, skill competitions, and "1+X" level certificates. After class, relevant test questions and micro courses are sent through the information teaching platform to consolidate the classroom teaching content; Actively organize students to participate in school level course competitions and "1+X" level exams, and conduct tests through the "1+X" level question bank mini program, achieving seamless integration with job requirements, skill competitions, and "1+X" level exams. The ideological and political education model is based on cultivating virtue and cultivating people, guided by the development of a strong technological country, and cultivating the talent of craftsmen.

The teaching content permeates the ideological and political elements of the course, focusing on broadening students' professional horizons and cultivating the talent of craftsmen. This course builds rich digital resources and provides learners with rich materials and diverse learning modes. Driving is mainly based on course animations, micro course videos, and virtual simulations, supplemented by diversified teaching resources such as course standards, lesson plans, case studies, question banks, and practical training worksheets. An online open course has been created at Xueyin Online, and a "online+offline" hybrid teaching approach has been implemented.

### **2.1.4 Reasonable selection of assessment methods**

The course evaluation adopts a combination of process based evaluation and outcome based

evaluation. Process based evaluation includes classroom performance evaluation, practical assessment, group presentation, online learning evaluation, etc. Result based evaluation adopts final online testing, mainly assessing students' mastery of online learning, theoretical learning, and practical skills, and providing feedback on the achievement of course objectives, in order to improve corresponding teaching links and adjust teaching content in a targeted manner, Improve teaching methods.

### 3. Practical effects

By organizing the teaching objectives, restructuring the teaching content, improving the teaching methods, and evaluating the teaching of this course, teaching reforms have been implemented to accurately align the course objectives with the training requirements. The effectiveness of classroom teaching is good, and students' participation, knowledge mastery, skill enhancement, changes in emotions and attitudes, problem-solving ability, critical thinking, teamwork ability, and learning motivation have all been effectively improved and exercised, Students' academic performance has also improved qualitatively.

### 4. Reflection and Improvement

Based on the OBE concept, the curriculum reform and construction of urban rail transit operation organization adhere to the guidance of industry enterprise needs and job ability needs, set course teaching objectives and design courses, reverse design teaching objectives, optimize teaching implementation process, integrate course teaching content, and effectively combine theoretical teaching with practical teaching. However, some aspects are not yet perfect, and further improvement is needed to truly achieve high-quality course standards, The following are improvement measures: (1) Strengthen the depth of school enterprise cooperation, invite enterprise experts to participate in the development of talent

cultivation plans, curriculum standards, curriculum construction and teaching, curriculum evaluation, and other activities in all aspects, and improve the external evaluation mechanism. (2) Upgrade and transform existing training equipment to reflect new industry technologies. (3) Build a resource library of ideological and political elements in courses, strengthen ideological and political construction in courses, construct new forms of textbooks, and promote the construction of curriculum textbooks. (4) Pay attention to the process evaluation of the course, sort out the scoring standards for practical training projects, establish a theoretical question bank corresponding to the assessment of course objectives, and improve the internal evaluation mechanism. (5) Regularly revise course standards, evaluate the rationality and achievement of course objectives, and provide timely feedback on the effectiveness of course teaching.

This article conducts curriculum reform from the perspectives of teaching objectives, teaching content, teaching methods, and teaching evaluation. The curriculum adheres to the basic concept of "student-centered, output oriented, and continuous improvement", and implements curriculum reform. The curriculum objectives support talent cultivation goals. The curriculum teaching design based on the OBE concept has strong pertinence, which is of great significance for improving students' professional practical abilities and cultivating their professional qualities, At the same time, it has certain demonstrative value in higher vocational education.

### Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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