

Research and Practice of Teaching Evaluation Reform Based on OBE: Taking the professional courses of mobile application development as an example

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Abstract: Research is conducted on the teaching model of "Internet plus Curriculum Ideology and Politics" based on collaborative education. Guided by the OBE (Outcome-Based Education) concept, and oriented towards practicality, practicality, and effectiveness, the theoretical courses, practical training projects, and comprehensive practical hierarchical system of mobile application development are decomposed. Professional abilities are analyzed, and the course content of "emphasizing both moral and practical abilities, and combining both cultural and technical skills" is jointly developed with enterprises. Emphasis is placed on cultivating student qualities, practicing the "craftsman spirit", and continuously promoting the exploration of online and offline blended teaching reform based on new forms of textbooks and combined with digital courses constructed on online platforms. Diversified construction reforms are made in teaching evaluation to promote the improvement of talent competency for job positions.

Keywords: Vocational Ability; OBE Concept; Teaching Reform; Teaching Evaluation

1. Introduction

OBE (Outcomes-based Education) emphasizes that educators must clearly define the abilities students should possess upon graduation and ensure that students achieve the expected outcomes through corresponding educational and instructional designs. OBE evaluates based on students' learning outcomes and drives the teaching process according to these outcomes. The Western Australian Department of Education defines OBE as "an educational process based on achieving specific student learning outcomes. Educational structures and curricula are seen as means rather than ends. If

they fail to contribute to cultivating specific student abilities, they must be rebuilt. Student outcomes drive the operation of the education system." The OBE philosophy emphasizes the basic ideas of "student-centeredness" rather than "teacher-centeredness," "outcome-orientation," and "continuous improvement." Teaching quality evaluation based on the OBE philosophy is an evaluation model oriented towards achieving outcomes [1]. The core of the OBE educational philosophy is "student-centeredness." "Outcome-orientation" emphasizes that teaching should be dynamically and continuously improved, and an effective continuous improvement mechanism must be established. Therefore, the evaluation of teaching quality should adopt a student-centered evaluation model, and this evaluation and improvement should be integrated throughout the entire student cultivation process. This study primarily focuses on the judicial information security professional course "Prison Informatization Project Management and Operation and Maintenance".

With the rapid iteration of the mobile internet industry, technologies such as mini-programs, cross-platform apps, and digital applications for mobile devices continue to be updated. The industry has raised higher standards for the practical ability, innovation ability, and job adaptability of technical skills talents in mobile application development. As the main platform for cultivating technical skills talents, vocational education must closely follow the needs of industrial development, optimize the teaching system based on job output orientation, and force the transformation and upgrading of teaching evaluation models. Outcome-Based Education (OBE) is student-centered, with learning outcomes as the core, and continuous improvement as the closed loop. It abandons the traditional teaching drawbacks of emphasizing theory over practice and process over output,

and is the core guiding concept of current vocational education teaching reform.

At present, there are still many shortcomings in the teaching evaluation of mobile application development courses in most vocational colleges in China [2]. Traditional evaluations primarily rely on final written exams and single project assessments, with a single evaluation dimension and rigid evaluation methods. They ignore students' individual learning differences, overall learning performance, and core competency output in the workplace, making it impossible to accurately measure students' comprehensive professional abilities such as mobile terminal project development, team collaboration, problem-solving, and technological innovation. At the same time, there is a lack of effective evaluation feedback and teaching optimization mechanisms, making it difficult to adapt to the real job requirements of enterprises and restricting the improvement of professional talent cultivation quality.

To address the aforementioned pain points in teaching evaluation and fulfill the reform requirements of enhancing quality and fostering excellence in vocational education, as well as cultivating talents through achievements, this study takes the OBE (Outcome-Based Education) educational philosophy as the core support and uses the mobile application development professional course as the research carrier. Based on the professional talent cultivation objectives and industry job competency standards, it reconstructs a diversified, whole-process, and closed-loop teaching evaluation system. By optimizing process-based assessments, refining ability output indicators, and establishing evaluation feedback and continuous improvement mechanisms, it breaks the limitations of traditional summative evaluation, realizes the transformation of teaching evaluation from "assessment scores" to "assessment abilities", and comprehensively enhances students' job adaptability and comprehensive professional qualities. This study aims to provide practical references for teaching reform in the mobile application development major in higher vocational education and also offer insights for OBE teaching evaluation innovation in similar computer-related majors.

2. Main Approach

This major's courses adheres to a career-oriented innovative modular education model. Typical

task-driven and case-based teaching methods are employed in the basic course module. Flipped classroom teaching is conducted utilizing a wealth of online courses. Project-based teaching and scenario simulation teaching methods are adopted in the curriculum. During practical training, a work process-oriented teaching method is used. A modular division of labor and collaboration teaching model is established, fostering a new situation of full-staff interaction [3].

2.1 Incorporating curriculum objectives based on the OBE concept

Based on the characteristics of engineering course teaching, when setting teaching objectives for this major's courses, we integrate value guidance into the process of knowledge impartation and ability cultivation. We add ideological and political goals such as thinking, character, and innovation, strengthen ideological and political guidance, and further align with graduation requirements indicators to support the output-based education (OBE) professional training objectives. By studying this major's courses, students systematically master the ability to develop mobile applications, and also cultivate the craftsmanship spirit, team spirit, and professional ethics required for project implementation, achieving the goal of curriculum education [4]. Under the OBE model, the design of ideological and political education in courses is comprehensively planned, following a design logic that starts from the top-level objectives and gradually implements them. It begins with the goal of talent cultivation, breaks down corresponding graduation requirements and graduation requirement indicators, and ultimately implements specific course objectives. Based on the determined course objectives, integration and construction are promoted from three dimensions. Firstly, we promote the integration of professional teaching content and ideological and political content, forming teaching syllabuses, lesson plans, and a case library for ideological and political education in courses. Secondly, we achieve the integration of online and offline teaching modes, completing the design of teaching activities for autonomous online knowledge acquisition and offline knowledge consolidation and reinforcement [5]. Thirdly, we combine information technology with process assessment, relying on online testing to achieve real-time

feedback on teaching effectiveness and dynamic continuous improvement of teaching quality. The entire teaching design ultimately focuses on educational effectiveness, aiming to guide students to understand professional ethics,

cultivate good professional qualities, nurture the Chinese spirit, further strengthen ideals and beliefs, and fulfill the educational mission of ideological and political education in courses. As shown in Figure 1.

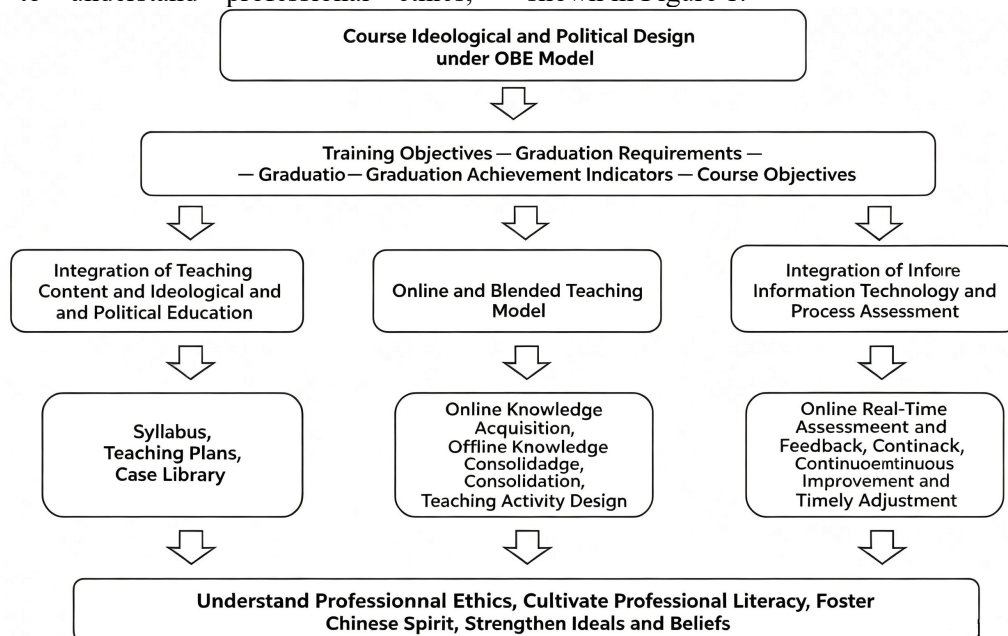


Figure 1. Ideological and Political Education Design in Courses under OBE Mode

2.2 Implement a Student-Centered Evaluation Model

This professional course adopts a "five-integration" teaching strategy for teaching. The teaching organization is divided into two stages. The first stage is the online teaching stage, which is mainly based on student self-study. The teaching methods mainly include video explanation, operation screen recording demonstration, and testing [6]. The second stage is the online and offline blended teaching stage, which is mainly organized through classroom teaching, utilizing the vocational education cloud platform, and conducting practical training in the training room. The teaching methods include group discussion, case teaching, experimental demonstration, and so on.

Before class, it is necessary to base on the goal of professional talent cultivation achievements, complete refined teaching design and teaching preparation. Teachers should combine the ability requirements of mobile application development positions, clarify the knowledge objectives, practical ability objectives, and professional quality objectives of the current class, and break down core teaching tasks such as classroom project development, function debugging, and interface optimization. At the same time, relying

on the teaching platform, preview tasks, learning resources, self-test exercises, and classroom project task lists are released, and preview content is designed for students based on their learning differences. Software and hardware equipment such as programming software, development simulators, and online teaching systems are debugged in advance, and a practical operation environment is set up. Common problems encountered by students during preview and breakthrough plans for key and difficult points in class are preset, and a pre-class learning situation diagnosis mechanism is constructed, laying the foundation for precise teaching and the implementation of whole-process procedural evaluation during class.

During the class, precise stratified teaching is conducted based on the pre-class learning data. Emphasis is placed on explaining and demonstrating technical difficulties that students commonly encounter, standardizing students' code writing, project development processes, and practical operation habits. The entire process of students' classroom practical operations is tracked, and process assessment indicators such as student participation in the classroom, task completion quality, team collaboration performance, and problem-solving abilities are

recorded in real time, implementing diversified classroom evaluation. At the same time, group achievement presentations, teacher-student mutual evaluations, and student-student mutual evaluations are organized. Student project outcomes are commented on in a timely manner, pointing out existing problems and optimization directions, guiding students to make corrections and improvements in class, ensuring that classroom teaching outcomes accurately align with preset ability goals, and achieving a deep integration of in-class teaching, practical operation training, and process evaluation.

After class, we comprehensively summarize students' learning data and evaluation results from the entire process before and during class, identify the overall learning shortcomings of the class and the individualized ability differences among students, and form a complete learning analysis report. Targeting the common and individualized problems in students' project outcomes, we carry out targeted after-class tutoring, special question-answering, and layered guidance, urging students to complete the rectification and optimization of their outcomes. At the same time, based on the teaching effectiveness of this course and the achievement of students' outcomes, we retrospectively review the deficiencies in teaching design, teaching methods, and evaluation methods, dynamically optimize subsequent teaching content, practical tasks, and assessment indicators, and build an OBE closed-loop teaching evaluation system of "pre-class preview - in-class training - after-class improvement - continuous improvement", continuously improving the quality of professional talent cultivation. Through extensive reading, we guide students to think deeply, engage in discussions, and complete textbook homework exercises to consolidate and master relevant knowledge.

2.3 Innovate Teaching Evaluation Methods based on the OBE Concept

The assessment of professional courses is a comprehensive evaluation based on student participation in classroom teaching, stage tests, and homework assignments [7]. Innovative OBE-based teaching evaluation methods are used to encourage students to learn autonomously. The assessment mechanism places students as the learning subjects, provides full support relying on network technology and resources, and designs diversified assessment

forms, specifically including attendance, frequency of online interactive communication, random classroom questioning, online classroom tests, and project discussion and analysis. Different assessment methods correspond to clear assessment objectives, thereby cultivating students' learning enthusiasm, autonomous learning ability, expression and communication skills, knowledge mastery, comprehensive knowledge application ability, independent thinking ability, and teamwork ability. After the assessment is completed, learning effect feedback is formed. On the one hand, it is provided to the teacher as feedback to help teachers improve the pertinence of teaching. On the other hand, it acts on the students themselves, guiding them to carry out purposeful learning, ultimately forming a complete closed-loop teaching evaluation system [8]. As shown in Figure 2.

This case adopts various assessment methods, focusing on the assessment of practical operation skills and application abilities. The total score of the course assessment is 100 points, consisting of four major parts: online assessment (40%), practical skills assessment (30%), final examination (20%), and teacher evaluation and student mutual evaluation (10%).

(1) Online assessment (40%), including 4 assessment items.

Assessment Item 1: Attendance Assessment (5%)
- Three unexcused absences will result in a score of zero for attendance.

Assessment Item 2: Courseware Learning (10%), including Learning Progress (60%), Evaluation (10%), Q&A (10%), Notes (10%), and Error Correction (10%).

Assessment item 3: Classroom activities (10%), including 20% for participation, 20% for classroom performance, and 60% for average test score.

Assessment item 4: Demonstration experiment assessment (15%) assesses students' learning attitude and whether they have achieved the ability cultivation objectives.

(2) Practical skills assessment (30%)

Assessment Item 5: Practical project skills assessment assignment, to assess whether students possess comprehensive abilities and advanced thinking skills to solve complex problems.

(3) Final assessment (20%)

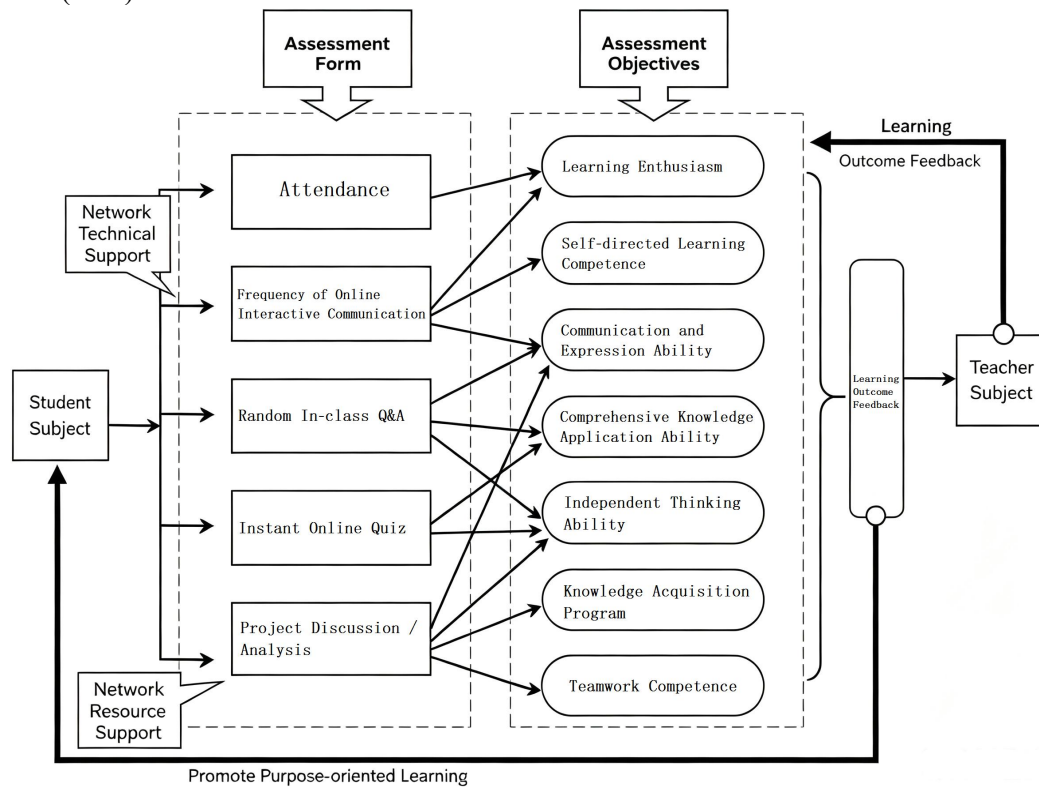
Assessment Item 6: Written Examination (10%)
- To assess whether students have achieved the

knowledge objectives.

Assessment Item 7: Mini-Interview (10%) - To assess whether the student possesses professional competencies and qualities.

(4) Teacher evaluation and student peer assessment (10%)

Assessment Item 8: Teacher Evaluation (5%) + Student Mutual Evaluation (5%). Based on the comprehensive performance of students, teacher scores and mutual evaluation scores will be given.



Promote Purpose-oriented Learning

Figure 2. OBE-based Teaching Evaluation Process

3. Results and Outcomes

In the student feedback after class, the students expressed:

(1) The classroom challenges are exciting. The three challenges in the lesson are designed to fully utilize the characteristics of post-00s police academy students, and the process of completing the challenges continuously stimulates students' interest in learning.

(2) Students enjoy incorporating workplace cases and real-life stories into science and engineering courses. The establishment of ideological and political education courses provides students with comparisons and contrasts during their learning process, gradually enhancing their sense of professional responsibility.

(3) They have developed the idea of active learning. Pre-class animation dubbing, market research, in-class Q&A discussions, self-study through micro-lessons, and post-class extension tasks have gradually led them to discover the significance of autonomous learning, subtly

enhancing their self-learning abilities. Student feedback further confirms the saying, "Interest is the best teacher"[9].

In terms of courseware learning results, only two students scored below 60 points, while the rest scored 60 points; the lowest score for classroom activities was 33.3 points, and the highest score was 83.1 points; the lowest score for homework was 4.88 points, and the highest score was 17.56 points; the shortest learning duration was 12 hours, 7 minutes, and 48 seconds, and the longest was 7704 hours, 21 minutes, and 10 seconds; according to the above online score proportion, one student did not exceed 60 points, while the rest scored between 60 and 61 points, indicating good online participation.

Through the integration of course content, job requirements, and certification standards, the "three integrations" have achieved remarkable results. Mastering course knowledge better aligns with job demands [10]. Students strive to obtain the "Project Management Engineer" certificate from the China Certified Software Testing and Software Engineering Professional

(CCSE) exam, participate in the college students' innovation and entrepreneurship competition, and their works have won provincial awards, reflecting the implementation effectiveness of the "course, job, and certification" approach [11].

Through the "three-total" teaching mode, which involves total participation, total process, and total teaching mode, significant effects have been achieved. Through the "total participation" of school/industry [12], the "total process" teaching mode before, during, and after class, and the "total implementation" of curriculum research, students are able to conduct overall project management, contract writing, cost and schedule analysis, and other operations.

Through situational education, labor education, and ideological and political education integrated into the curriculum, the "three educations" have achieved remarkable results. Situational education has made students more familiar with their positions, while labor education has instilled in them a sense of labor and a craftsman's spirit. At the same time, professional abilities such as quality control and risk management have been greatly improved.

4. Conclusion

The teaching evaluation model based on the OBE (Outcome-Based Education) concept proposed in this article provides guidance for teaching quality assurance, accurately reflects the status of education and teaching quality, and supports curriculum construction, education and teaching quality assurance, and the achievement of talent cultivation goals. However, teaching targets human beings, and there are many variable factors in the teaching process, making it difficult to quantify quality and achieve precision. Although continuous improvement of the evaluation mechanism is necessary to more accurately guide teaching, in practical implementation, the timeliness of improvements, the amount of content improved, and the grasp of intensity all affect the efficient operation of the evaluation system. If we are overly concerned with formalities and frequently correct certain details, it may affect the normal teaching pace, continuity, and ultimately the smooth progress of teaching activities. The OBE-based teaching quality evaluation model, starting from promoting the achievement of training objectives, combines the actual situation of the course, and continuously explores and

improves under the principles of comprehensive consideration, scientific analysis, and reasonable promotion, to maximize its intended function and value.

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