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A Study on the Reform of WeChat Mini-Program Course Teaching Based on the OBE Paradigm

Jiaying Wang *, Yu Yang, Mingqi Jiang

College of Computer Science and Artificial Intelligence, Guangdong University of Science and Technology, Dongguan, Guangdong, 523083, China

*** Corresponding author:** Jiaying Wang

Abstract: With the rapid development of information technology and the widespread adoption of mobile internet, WeChat Mini Program, as a lightweight application form, has become an important teaching content in computer-related majors in universities. However, traditional teaching modes often focus on knowledge impartation, neglecting the cultivation of students' abilities and the achievement of learning outcomes. Based on the concept of OBE, this paper conducts a systematic reform study on WeChat Mini Program course teaching. Firstly, it expounds the core connotation of OBE concept and its guiding significance for curriculum reform, and then proposes an overall idea of curriculum reform oriented towards learning outcomes. On this basis, a complete teaching plan is designed from four dimensions: teaching objectives, teaching content, teaching methods, and assessment and evaluation. Through comparative experiments and questionnaire surveys, quantitative and qualitative analysis of the implementation effect of teaching reform is conducted. The research results show that teaching reform based on OBE concept significantly improves students' project practical ability, autonomous learning ability, and innovative thinking, and the satisfaction with course teaching has also increased. This study provides practical experience and theoretical reference for the teaching reform of programming courses in application-oriented undergraduate colleges.

Keywords: OBE Philosophy; WeChat Mini-program; Teaching Reform; Outcome-based Education.

1. Introduction

Since officially launching, WeChat Mini Programs have quickly become an important application form in the mobile internet field, thanks to their no download needed, use and go feature. By the end of 2025, daily active users of WeChat Mini Programs had exceeded 600 million, covering over 200 niche industries including e-commerce, education, healthcare, and government services, with strong ongoing demand for Mini Program developers [1]. Given such market realities, more universities have begun adding Mini-Program development to the curriculum for computer science and software engineering majors. Schools hope to train application-focused graduates who fit actual enterprise requirements.

However, the current teaching of WeChat mini program courses generally has the following issues. First, the teaching objectives are not clear enough, and the course content is disconnected from the actual needs of enterprises. Second, the teaching method is mainly teacher-led, with students passively receiving knowledge, lacking opportunities for active exploration and practice. Third, the assessment methods are single-minded, focusing on memorization of theoretical knowledge, making it difficult to comprehensively measure students' overall abilities[2]. The root cause of these problems lies in the lack of a clear capability-oriented course design, failing to design courses backward from the learning outcomes that students are ultimately expected to achieve.

OBE (Outcome-Based Education) emphasizes starting from students expected learning outcomes and designing the course system, teaching activities, and evaluation methods backward[3]. This paper takes the WeChat mini program course at Guangdong University of Science and Technology as the research object, systematically introducing the OBE concept into course teaching reform, and exploring the construction of a learning-outcome-oriented teaching model. This research aims to tackle common drawbacks including ambiguous objectives, monotonous teaching styles and one-sided evaluation. It can also delivers usable references for similar programming-course reforms at other application-focused undergraduate institutions.

2. The Conceptual Essence of OBE and Approaches to Curriculum Reform

2.1. The Core Essence of the OBE Philosophy

Four core principles constitute the OBE framework: outcome focus, backward design, high expectations, and expanded learning opportunities[4]. Outcome focus means teachers should clearly specify the knowledge, practical skills and comprehensive qualities students ought to acquire after finishing a course. All teaching arrangements should serve these preset targets. Backward design requires educators to work backwards from final learning outcomes. Course goals, content modules, teaching strategies and assessment criteria are formulated in sequence to guarantee alignment with expected outputs. High expectations mean setting challenging but achievable learning tasks for every learner, on the core belief that proper support enables every student to make academic progress. Expanded opportunities mean schools should provide diversified learning paths and sufficient instructional resources. In this way, students with different learning foundations can reach course-level learning goals[5-6].

Compared to conventional modes, OBE brings three critical shifts. It moves from teacher-centered to student-centered. It shifts from knowledge transmission to competency development. It stops obsessing over the teaching process and starts focusing on learning outcomes[7]. This change is particularly meaningful for heavily practical subjects such as Mini-Program development. Memorising

API syntax will never be the ultimate goal of this course. What truly matters is helping students apply technical tools to solve real-world business problems.

2.2. Overall Approach to Curriculum Reform

We propose a complete reform workflow tailored for the WeChat Mini-Program course based on OBE logic. It follows a closed-loop logic: define expected learning outcomes, design teaching activities, implement classroom instruction, assess teaching effects, and promote continuous optimization. The overall curriculum reform framework is presented in Figure 1.

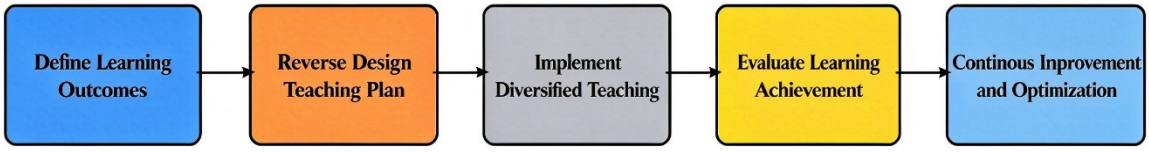


Fig 1. Framework for curriculum teaching reform

Step 1: Define the expected learning outcomes. Based on industry needs research, graduate tracking feedback, and employer evaluations, clarify the core abilities students should have after completing the WeChat Mini Program course, including five aspects: mini program architecture design, front-end interface development, cloud development application, project collaboration, and innovative practice ability.

Step 2: Conduct backward instructional design. Expected learning outcomes are decomposed hierarchically into course-level goals, module-level goals and individual class goals. Corresponding teaching content, suitable instructional strategies and supporting resources are developed accordingly. Every teaching segment is purpose-built to help learners reach preset outcomes.

Step 3: Deliver diversified classroom instruction. Multiple teaching approaches including project-based learning, flipped classroom and collaborative group work are adopted. An integrated online-offline learning environment is built. It provides students with abundant hands-on practice and personalised academic support.

Step 4: Establish an outcome-oriented evaluation system. Assessment tools were custom-built for our expected learning outcomes. By combining formative and summative assessments, we focus on testing students' actual abilities.

Step 5: Continuous improvement. Drawing upon assessment data and feedback collected from teachers and students, we regularly review and fine-tune teaching objectives, content arrangements and instructional strategies. This creates a self-reinforcing positive cycle for curriculum optimisation.

3. Instructional Plan Design

3.1. Instructional Objective Design

Guided by the OBE concept, the teaching objectives focus on three core competency dimensions. Knowledge objectives cover mastering the Mini Program framework, APIs, and cloud development technology. Skill objectives focus on the ability to independently complete a commercial-level Mini Program project. Quality objectives aim to cultivate engineering thinking and team collaboration spirit. Together, they form a three-dimensional target system.

We reorganized the course content into five progressive teaching modules around these expected learning outcomes. Each module has corresponding practical projects and stage-based achievement requirements aligned with specific competency goals. This creates a progressive learning path: basic, intermediate, comprehensive, and innovative. For example, students first complete a personal resume Mini Program. Then, they develop a campus navigation Mini Program, followed by a community Mini Program with a user system. Finally, students work in teams to complete a full commercial-level Mini Program project. They are also encouraged to participate in university innovation and entrepreneurship projects or academic competitions.

3.2. Instructional Method Design

To effectively achieve the desired learning outcomes, this course uses diverse teaching methods and builds a hybrid teaching model that combines online and offline as well as in-class and extracurricular learning.

1. Project-Based Learning (PBL). Real projects serve as the medium. Course knowledge points are integrated into every stage of project development. Through completing projects, students not only master technical knowledge but also develop engineering practice skills like problem analysis and problem-solving. The course includes both individual and team projects. Individual projects focus on basic skill training, while team projects simulate real corporate scenarios to cultivate collaboration and project management abilities.

2. Flipped Classroom. Students learn foundational content before class using pre-recorded micro-lectures and curated online resources. Classroom time is freed up for Q&A exchanges, case discussions and hands-on lab exercises. The instructional emphasis shifts away from teacher lecturing and toward active student learning. In-class observations confirm that this arrangement boosts classroom interaction and improves knowledge internalisation.

3. Collaborative Learning Method. Students are divided into project groups of 4-5 people. Each team assigns realistic job roles: project manager, front-end developer, back-end developer, and tester. This mirrors how real-world enterprise development teams operate. We encourage regular role rotation. Every student gets exposure to different job responsibilities and builds balanced, well-rounded skills.

4. Case Teaching Method. We select real-world commercial examples such as Mini-Program shopping platforms, online-education systems and smart-campus applications. Students analyse technical architecture, functional logic and end-user-experience design, so as to cultivate engineering thinking and product-design awareness. Industry engineers are invited as guest speakers to share genuine on-the-job project stories. This keeps course content closely aligned with current industry practice.

4. Instructional Assessment and Reflection

4.1. Instructional Assessment

Following OBE concepts, the course implements a multi-dimensional whole-process assessment system integrating formative and summative evaluation. It comprehensively measures how well students achieve each preset learning outcome. Formative assessment items cover classroom engagement, homework submissions, lab reports, phased project deliverables, online learning statistics and final comprehensive projects. Evaluation runs through the whole teaching semester to push students to value steady daily accumulation.

Instead of relying only on teacher scoring, peer assessment and student self-assessment are also introduced to enhance objectivity and completeness of evaluation results. More attention is paid to practical-skill examination. Project defence and code review activities are used to test students' development proficiency and engineering literacy. This multi-faceted assessment system reflects genuine learning outcomes and motivates consistent student effort.

4.2. Teaching Reflection

Despite the improvements, some issues remain. Some students show a lack of self-directed learning under the flipped classroom model. Accustomed to passive knowledge reception, they submit low-quality pre-class preparation work, which weakens in-class interaction and deep discussion. The difficulty gradient of the projects also needs improvement. Some students feel comprehensive projects are too difficult. In team projects, free-riding can happen, with some members not participating much. The subjectivity of evaluation standards still needs to be reduced. Even with multi-subject assessment mechanisms, peer-assessment and self-assessment rubrics lack sufficient granularity, which may lead to arbitrary scoring. Teaching resource construction should also be strengthened. Certain modules lack sufficient online supporting materials, and micro-lecture videos cannot fully satisfy personalized learning demands for students with varied academic backgrounds.

5. Conclusion

This article, guided by the OBE concept, carries out a systematic teaching reform study for the WeChat Mini Program course. The study builds a reform framework of defining outcomes, designing teaching, implementing teaching, evaluating results, and continuous improvement, and designs a complete teaching plan from four dimensions: teaching objectives, teaching content, teaching methods, and assessment. Through a semester of teaching practice and comparative analysis, it can be concluded that teaching reform based on the OBE concept significantly improves students academic performance, noticeably enhances their project practice ability and innovative thinking, increases satisfaction with the course, and greatly improves students' approval of teaching content, methods, and assessment. The OBE concept provides effective theoretical guidance and a methodological framework for teaching reform in programming courses, and its design approach has strong operability and promotion value.

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