



Construction of Practical Teaching Mode of Financial Engineering Specialty Based on OBE Philosophy

Yi Zhou^{1,*}, Hongkun Zuo¹, Yuhong Huo¹, Zebin Liu¹, Lei Shen¹, Lina Ba¹
and Yun Liu²

¹School of Finance and Mathematics, Huainan Normal University,
Huainan, 232038, P. R. China

²School of Electric Engineering, Huainan Normal University, Huainan, 232038, P. R. China

*Corresponding author: zhouyi3280@163.com

Abstract. Taking the practice teaching of financial engineering as the research object, this paper discusses the challenges and corresponding countermeasures in implementing the Outcome-Based Education (OBE) philosophy in this field. Initially, the article defines the core elements of the OBE concept and analyzes its application value in the practice teaching of financial engineering. Subsequently, through a status quo analysis, the paper reveals the problems in the practice teaching of financial engineering, including insufficient teaching resource allocation, a disconnect between teaching methods and industry demands, and inadequate cultivation of students' practical abilities. Based on this, the article further discusses the implementation path of the OBE concept in the practice teaching of financial engineering, including clarifying teaching objectives, optimizing teaching content, innovating teaching methods, and improving the assessment system. In response to the challenges in the implementation process, this paper proposes a series of strategies, such as strengthening teacher training, improving teaching facilities, stimulating students' motivation to learn, and establishing effective assessment and feedback mechanisms. Finally, conclusions and improvement suggestions are provided.

Keywords: OBE Philosophy; Financial Engineering; Practice Teaching; Teaching Reform

1 Introduction

With the continuous evolution of globalization and financial markets, the importance of financial engineering education is becoming increasingly prominent [1]. The financial engineering major aims to cultivate professionals who can use mathematics, statistics, and computer technology to solve complex financial problems. However, traditional teaching models often focus on the impartation of theoretical knowledge while neglecting the cultivation of practical skills, which creates a gap between the actual needs of the financial industry and the talents [2]. The introduction of the Outcome

Based Education (OBE) philosophy provides a new perspective for the reform of financial engineering education [3]. OBE emphasizes student-centeredness and focuses on the achievement of learning outcomes, which coincides with the goals of practice teaching in financial engineering.

Though Despite advancements in financial engineering education, previous studies [4,5] have not fully integrated industry-focused curricula or aligned teaching with the practical skills demanded by finance. There's a clear need for more innovative assessments to match the industry's dynamism. This paper addresses these gaps by exploring the challenges and strategies in implementing OBE in practice teaching, focusing on improving educational quality to prepare students for financial industry demands. It evaluates OBE's current status, identifies implementation challenges, and proposes effective strategies to overcome them.

The structure of the thesis is arranged as follows: Chapter 1 is the introduction, which introduces the research background, significance, purpose, problems, methods, and structure; Chapter 2 provides an overview of the OBE concept; Chapter 3 analyzes the current situation of practice teaching in financial engineering; Chapter 4 discusses the application of the OBE concept in the practice teaching of financial engineering; Chapter 5 analyzes the challenges of implementing the OBE concept; Chapter 6 proposes strategies to address the challenges; Chapter 7 presents the conclusions and suggestions.

2 Overview of OBE Concept

2.1 Application of OBE Concept in Higher Education

Outcome-Based Education (OBE), proposed by American educator Spady in 1981, is an education model centered on student learning outcomes. The application of the OBE concept in higher education has become a key trend in promoting educational reform, especially in higher education institutions in the United States, Australia, and Europe, where this concept has promoted significant changes in curriculum design, teaching methods, and assessment systems. Curriculum design is now more focused on learning outcomes, ensuring that curriculum content and structure help students master key knowledge and skills [6]. Teaching methods are also becoming more diverse, including case studies, project-based learning, flipped classrooms, etc., aiming to increase student participation and practical ability. At the same time, the assessment system has shifted to a learning outcome-based approach, combining formative and summative assessments to comprehensively evaluate students' learning achievements.

2.2 Compatibility of OBE Concept with Financial Engineering Practice Teaching

The practice teaching of financial engineering aims to cultivate students' ability to solve practical financial problems and has a high degree of compatibility with the OBE concept in terms of its goal consistency, that is, both are committed to enhancing students' practical application abilities. Integrating the OBE concept into the practice teaching of

financial engineering can effectively cultivate students' professional skills and innovative abilities, laying a solid foundation for their future careers [7]. For example, in curriculum design, case studies related to actual problems in the financial industry can be introduced, and students can be trained in investment decision-making using simulated trading platforms. A variety of assessment methods such as project reports, peer reviews, and actual trading performance can be used to comprehensively evaluate students' learning outcomes.

3 Financial Engineering Practice Teaching Status Analysis

3.1 Current Models and Methods of Financial Engineering Practice Teaching

Financial engineering practice teaching is evolving with diverse, practical methods like simulated trading labs, case studies, project-based learning, flipped classrooms, industry partnerships, competitions, and blended learning. These approaches enhance students' operational skills in simulated markets, foster critical thinking and teamwork through case and project work, and promote self-directed learning and professional skills through industry engagement and competitions. The goal is to boost students' practical abilities, decision-making, and innovation to meet financial industry demands.

3.2 Problems in Financial Engineering Practice Teaching

There are currently widespread problems in the practice teaching of financial engineering, including the singularity and obsolescence of teaching content and methods, and a disconnect with the actual needs of the financial industry [8]. While numerous universities have developed financial engineering labs and practice teaching facilities, there is a noted deficiency in the teaching content's depth of qualitative and quantitative analysis, which hinders the comprehensive development of students' abilities to solve real-world problems. [9]. In addition, practice teaching methods do not systematically cultivate students' hands-on abilities and innovative capabilities, and traditional simulation training differs from the actual working environment. At the same time, there is a lack of sufficient practical experience and quantity in the teaching staff, with many teachers lacking a background in the financial industry, which limits the quality of teaching [10]. The number and quality of internship and training bases both inside and outside the university also fail to meet the practical ability training needs of students. The existence of these problems restricts the cultivation of students' practical abilities and professional qualities, affecting the further improvement of the quality of financial engineering education.

4 Implementation of OBE Philosophy in Financial Engineering Practice Teaching

4.1 Setting Objectives for Financial Engineering Practice Teaching under the OBE Philosophy

Guided by OBE principles, financial engineering practice teaching aims to develop students' practical skills for career success. It targets core competencies in financial analysis, risk management, and investment, along with fostering innovation and critical thinking. The curriculum is reverse-engineered to align courses with these capabilities, emphasizing individual growth and adaptability to a dynamic financial sector. These objectives prioritize both knowledge acquisition and the development of professional qualities to bridge education with industry needs.

4.2 Reform of Content and Methods in Financial Engineering Practice Teaching under the OBE Philosophy

The focus of practice teaching content reform is to enhance the practicality and forward-looking nature of the curriculum by introducing advanced technologies and tools in the modern financial field, such as financial technology, big data analysis, and artificial intelligence, to update and enrich teaching content. At the same time, teaching method reform focuses on improving student participation and practical ability, adopting interactive and experiential teaching methods such as case studies, simulated trading, and project-based learning, allowing students to learn and apply financial knowledge in the process of solving actual problems.

In addition, the OBE philosophy encourages teachers to adopt innovative teaching models such as flipped classrooms and blended learning, combining online self-study with offline discussion to improve classroom efficiency and stimulate students' interest and initiative in learning. In terms of the assessment system, the OBE philosophy advocates for the establishment of a student learning outcome-centered evaluation mechanism, using diversified evaluation methods to comprehensively assess students' learning achievements and promote the improvement of students' comprehensive abilities. Through these reform measures, the practice teaching of financial engineering will pay more attention to students' ability cultivation, helping students to establish a knowledge system and skill structure that matches future career development.

5 Challenges in Implementing the OBE Philosophy

5.1 Challenges in Teachers' Teaching Concepts and Capabilities

The implementation of the OBE philosophy requires teachers to transition from traditional knowledge transmitters to facilitators and guides of student learning outcomes. This implies that teachers need to update their teaching concepts and master new teaching skills, such as guided instruction, peer evaluation, and how to design and implement

outcome-focused assessments. To meet this challenge, educational institutions need to provide continuous professional development opportunities for teachers.

5.2 Challenges in Students' Learning Motivation and Participation

The OBE philosophy emphasizes the central role of students and the importance of autonomous learning. However, in practice, it is often challenging to address issues such as students' lack of clear learning objectives, insufficient self-motivation, and poor adaptability to new learning models. Educational institutions must not only provide teaching designs that align with the OBE philosophy but also employ strategies to increase student engagement and participation in the classroom, such as personalized guidance, enhancing course interest, and establishing effective incentive mechanisms.

5.3 Challenges in Assessment and Feedback Mechanisms

Many universities still rely on conventional examination methods and tests, which are primarily designed for summative evaluation at the end of a course. This approach often overlooks the importance of formative evaluation, which involves continuous assessment and feedback throughout the learning journey, crucial for student development. Furthermore, the assessment criteria frequently fail to align seamlessly with the OBE philosophy, resulting in an incomplete evaluation of students' competencies. This shortcoming is particularly evident in the assessment of soft skills, such as innovation, critical thinking, and teamwork, which are increasingly vital in the modern workforce but are not always adequately measured by traditional academic evaluations.

5.4 Challenges in Aligning Courses with Industry Demands

Adopting the OBE approach presents a considerable challenge in aligning curriculum content closely with the evolving needs of the industry. At present, the curriculum updates in numerous universities are not agile enough to match the swift advancements in the financial sector, resulting in a gap between the educational outcomes and the practical skills demanded in the job market. Especially after the emergence of artificial intelligence, there are new industry job demands, such as intelligent customer service, intelligent marketing, and risk management.

6 Strategies to Address the Challenges

6.1 Teacher Training and Professional Development

To tackle the challenges associated with the implementation of the OBE philosophy, particularly in updating teachers' teaching concepts and capabilities, universities need to establish comprehensive teacher training and professional development plans. This includes providing ongoing education and training opportunities, such as seminars, workshops, and online courses, to help teachers understand the core elements of the

OBE philosophy and teaching strategies. Additionally, teachers should be encouraged to engage in teaching research to foster innovation in teaching methods and the improvement of assessment systems. Furthermore, teachers should be motivated to collaborate with industry experts to ensure that teaching content aligns with actual work demands and to enhance their professional skills through practice and research. Teacher professional development should also include regular evaluation and feedback on teaching outcomes to promote continuous improvement in teaching practices and better meet the learning outcomes-oriented needs of students

6.2 Strategies to Stimulate Students' Learning Motivation and Participation

Teachers can design more interactive and participatory teaching activities to enhance students' initiative and participation in learning, such as group discussions, case competitions, and role-playing, to increase students' sense of classroom involvement and teamwork skills. Moreover, teachers can provide personalized learning support and feedback, helping students set clear learning objectives and track their progress, thereby enhancing students' autonomy in learning and sense of achievement. Institutions can also use technological means, such as learning management systems and mobile applications, to provide personalized learning resources and real-time feedback, as well as establish incentive mechanisms, like scholarships, recognition programs, and internship opportunities, to reward students for their active participation and excellent performance. Through these strategies, student learning motivation can be effectively increased, promoting their active involvement and thereby improving learning outcomes.

6.3 Establishing Effective Assessment and Feedback Mechanisms

Administrators and teachers need to devise a variety of comprehensive assessment methods that go beyond measuring students' acquisition of knowledge to also assess their practical skills, problem-solving proficiencies, and creative thinking. This encompasses both formative assessments, such as in-class participation, collaborative projects, and interim evaluations, and summative assessments, including final examinations and capstone projects. To foster self-reflection and critical thinking among students, regular peer assessments and self-evaluations should be integrated into the learning process. Educational institutions should offer prompt feedback to assist students in recognizing their academic trajectory and identifying areas for enhancement. Furthermore, leveraging technology platforms can facilitate the collection and analysis of student learning data, allowing educators to fine-tune their instructional strategies to align more closely with the desired learning outcomes of their students. These approaches will lead to a more holistic and transparent assessment and feedback system, which is instrumental in encouraging ongoing student learning and advancement.

6.4 Strengthening the Alignment of Courses with Industry Demands

To align with the OBE philosophy, a suite of strategies must be implemented to ensure that courses are in sync with the industry's requirements. firstly, the curriculum should incorporate the most current trends and technological developments in finance, encompassing new domains like intelligent customer service, innovative marketing strategies, and intelligent risk management techniques. Tailoring the curriculum to job capability requirements involves the introduction and enhancement of courses that cover natural language processing and the ethical and legal implications of AI. Secondly, universities should establish close cooperative relationships with the financial industry through industry advisory committees, internship programs, and workshops to ensure that educational content is timely and relevant. Additionally, curriculum design should be reverse-engineered, starting from the capabilities that students should achieve after graduation, to design a curriculum system that equips students with the necessary knowledge and skills for future financial engineering roles. Through these measures, a richer, more practical, and industry-relevant learning experience can be provided for students.

7 Conclusions and Recommendations

7.1 Summary of the Study

The conclusions drawn from the reform of practice teaching in the financial engineering major indicate that to effectively implement the Outcome-Based Education (OBE) philosophy, it is essential to thoroughly update teaching content to reflect the latest industry trends, enhance the professional skills and teaching methods of teachers, enrich teaching resources and facilities, stimulate students' motivation to learn, establish effective assessment and feedback mechanisms, and closely align courses with industry demands. The implementation of these reform measures requires close cooperation and continuous effort between schools, teachers, students, and the industry to ensure the improvement of educational quality and the successful cultivation of professional talents. Through these comprehensive reforms, financial engineering education will be better able to adapt to the needs of the financial market and cultivate financial engineering professionals with practical capabilities and an innovative spirit.

7.2 Recommendations for the Reform of Practice Teaching

To enhance practice teaching in financial engineering, recommend strengthening teacher training in OBE philosophy, optimizing resources for practical activities like simulated trading, and designing interactive lessons. Implement an outcomes-focused assessment system for timely feedback. Reverse-engineer curriculum design to meet industry needs and integrate work placements to prepare students for future financial market demands. These steps aim to significantly boost the quality and effectiveness of financial engineering education.

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