

Reform and Practice of Teaching Models for Financial Experiment Courses from the Perspective of Industry-University-Research Integration

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Abstract: Under the background of industry-university-research integration, the teaching model of financial experiment courses in universities needs innovation and optimization to cultivate high-quality, multidisciplinary talents capable of meeting the demands of the modern financial industry. This study, adopting the perspective of industry-university-research integration, deeply analyzes the issues in teaching objectives, content design, teaching methods, and evaluation mechanisms of financial experiment courses. It proposes measures such as strengthening university-enterprise cooperation, introducing financial technology tools, optimizing teaching content, improving teachers' practical experience, and reforming assessment methods to construct a practice-oriented teaching model. Using a case study of financial experiment course reform in a university, the research explores specific implementation paths to incorporate real financial data, industry cases, simulated trading platforms, and innovative projects into teaching. It emphasizes the comprehensive development of students' practical abilities, innovative thinking, and overall qualities. The results show that the reform of the teaching model through deep integration of industry, academia, and research significantly enhances students' financial practice skills and innovation awareness while effectively bridging the gap between academic education and industry needs. This provides theoretical and practical support for the reform of experimental courses in financial disciplines.

Keywords: Industry-University-Research Integration; Financial Experiment Courses; Teaching Model Reform.

1. Introduction

With the continuous evolution of the global financial market and the rapid development of financial technology, the discipline of finance faces unprecedented challenges and opportunities. The traditional educational system in finance has achieved certain success in cultivating students' theoretical knowledge and foundational skills. However, with the application of emerging technologies such as big data, artificial intelligence, and blockchain, the demand for finance professionals has fundamentally changed (Zhang, 2019). Particularly in the context of the rapid growth of financial technology, the financial industry increasingly requires innovative and multidisciplinary finance professionals who not only possess a solid theoretical foundation but also strong practical and innovative capabilities (Shao et al., 2017). How to effectively cultivate students' practical abilities and comprehensive qualities through high-quality financial experiment courses has become a critical issue in the current reform of finance education.

As is well known that many limitations of traditional financial experiment teaching models. E.g., traditional financial experiment teaching models typically focus on theoretical instruction, emphasizing students' understanding of financial principles and methods while lacking real-world application and hands-on practice. This approach fails to meet the rapid development needs of the modern financial industry and cannot effectively cultivate students' innovative thinking and problem-solving abilities. For example, Li & Liu (2023) point out that traditional methods in finance courses often overlook the complexities involved in real-world financial

operations and decision-making processes, leaving students ill-prepared to handle real-world financial challenges.

The industry-university-research integration model serves as a critical approach to bridging the gap between traditional teaching methods and industry needs. By fostering in-depth collaboration between universities, enterprises, and research institutions, universities can better grasp industry trends and cutting-edge technologies, integrating them into the curriculum to enhance its practicality and innovation. Bennett (2015) highlights the importance of industry-university-research integration in higher education, noting that collaboration with enterprises makes education more aligned with industry needs, providing students with broader employment and entrepreneurial opportunities. In financial experiment courses, integrating enterprise needs, industry practices, and research outcomes not only enhances students' practical skills but also fosters their ability to solve complex financial problems. This has become a key direction in education reform (Cong et al., 2022).

Considering the theoretical needs and practical value, this paper aims to explore the reform and practice paths for teaching models of financial experiment courses in the context of industry-university-research integration. First, it reviews the main issues faced in the current teaching of financial experiment courses, including the disconnection between course content and industry needs, insufficient resources for experiment teaching, and lack of practical experience among instructors. Then, based on the concept of industry-university-research integration, it proposes a series of targeted reform strategies, emphasizing curriculum content updates, innovative teaching methods, deepened

collaboration between academia and industry, and the cultivation of interdisciplinary skills. Finally, through case analysis and practical exploration, the paper demonstrates the feasibility and implementation effects of the reform in financial experiment courses under this model. Through this study, it is expected to provide theoretical support and practical guidance for the reform of experimental courses in finance, aiming to cultivate high-quality, multidisciplinary finance professionals capable of addressing future challenges in the financial industry.

2. Issues in Financial Experiment Courses under the Background of Industry-University-Research Integration

Reforming financial experiment courses in the context of industry-university-research integration is critical to staying aligned with the latest developments in the financial industry, breaking away from traditional teaching models and course designs, and focusing on cultivating students' practical abilities. By promoting deeper integration of industry, academia, and research, building high-quality teaching faculties, and fostering interdisciplinary cooperation and innovation, financial education quality can be effectively enhanced. Ultimately, the goal is to nurture "multidisciplinary and innovative finance professionals who meet the demands of the modern financial industry." Based on a review of existing literature and data analysis, the following main issues are identified in financial experiment courses from the perspective of industry-university-research integration:

2.1. Disconnection between Course Content and Industry Needs, Insufficient Practical Experience among Instructors

The rapid development of the financial industry, particularly the rise of financial technology, has rendered much of the traditional knowledge and content in financial disciplines outdated. This disconnection between course content and actual industry requirements results in students' knowledge being poorly aligned with the working environment they will face (Zheng, 2018).

Moreover, many instructors in finance disciplines have solid theoretical foundations but lack practical experience in financial operations and industry applications. This results in a curriculum heavily focused on theory, lacking the depth required to address real-world industry scenarios and impart specialized skills (Zhang, 2019).

2.2. Insufficient Teaching Resources and Shallow Industry-University-Research Cooperation

First, financial experiment courses rely on advanced financial data, software tools, and experimental platforms. However, many universities face shortages of experimental equipment and technological resources. For instance, the absence of big data analytics platforms, quantitative analysis tools, or simulated trading systems limits students' ability to perform advanced practical operations and in-depth analysis.

Second, in the context of industry-university-research integration, many universities and enterprises maintain only superficial collaborations, lacking robust cooperative mechanisms. Course design and teaching content often fail to

incorporate the real needs of enterprises, and students struggle to access cutting-edge industry challenges during internships or practical training (Alex, 2023).

2.3. Inadequate Evaluation Mechanisms and Lack of Innovation and Interdisciplinary Integration

On one hand, many financial experiment courses still rely on traditional written examinations as the primary evaluation method. These assessments fail to comprehensively evaluate students' practical abilities, innovative thinking, and teamwork skills. There is a lack of evaluation standards based on the needs of industry-university-research integration, which makes it difficult to accurately reflect students' capabilities in real financial operations (Li & Liu, 2023).

On the other hand, current experimental courses are often confined to traditional financial knowledge and techniques, lacking deep integration with disciplines such as computer science and data science. This prevents the full realization of the advantages of interdisciplinary collaboration and innovation. Financial experiment courses should strengthen the introduction of emerging fields like artificial intelligence and big data analytics to cultivate students' interdisciplinary and innovative capabilities.

3. Reform Pathways for Financial Experiment Courses in the Context of Industry-University-Research Integration

Reforming financial experiment courses in the context of industry-university-research integration requires comprehensive thinking and systematic design across multiple dimensions to ensure that students acquire the knowledge and skills necessary for the modern financial industry. Based on existing challenges, this section proposes feasible reform pathways focusing on curriculum content updates, enhanced industry-university-research collaboration, improved teacher practical abilities, and optimized teaching evaluation systems.

3.1. Updating Curriculum Content and Promoting Resource Sharing

(1) Updating curriculum content to align with industry frontiers. On the one hand, introducing FinTech and big data applications. With the rise of financial technology (FinTech), financial experiment courses should keep up with the times by incorporating content on emerging fields such as big data analytics, artificial intelligence, blockchain, and quantitative trading. Courses should not only introduce the fundamental principles of these technologies but also include experimental practices to enable students to master their practical applications in the financial industry. On the other hand, strengthening case-driven teaching. Course design should leverage industry case studies to guide students in analyzing and solving real-world financial problems. For example, students could engage in cases involving simulated stock market analysis, portfolio optimization, and risk management. Such cases allow students to experience practical financial challenges and explore solutions through hands-on practice.

(2) Deepening industry-university-research integration and promoting resource sharing. Firstly, collaborating with financial enterprises to build experimental platforms:

Universities should enhance cooperation with financial institutions and technology companies to establish shared experimental platforms. By collaborating with enterprises, students gain access to the latest financial data, real market information, and cutting-edge technologies, thereby enhancing the practicality and innovation of experimental teaching. Secondly, jointly developing courses and experimental projects. Enterprises can participate in course design, integrating industry demands and frontier technologies into experimental projects. Additionally, universities can invite industry experts and leaders to deliver lectures and host discussions, enriching students' industry knowledge and practical experience.

(3) Strengthening practical opportunities through university-enterprise cooperation to expand students' career prospects. Wang et al. (2020) note that collaboration between financial experiment courses and enterprises can enhance students' practical abilities and increase the societal value of education through initiatives such as jointly building experimental platforms, designing internship programs, and offering mentorship by industry professionals. In the context of industry-university-research integration, financial experiment courses should not only reinforce on-campus experimental teaching but also encourage students to step out of the classroom and undertake internships at financial institutions and technology companies. Through practical experience, students can better understand the real-world application of classroom knowledge, gain valuable industry exposure, and prepare for future employment. Furthermore, establishing university-enterprise joint training mechanisms. By jointly implementing targeted talent development programs for the financial industry, enterprises can provide students with internship opportunities and job placements, while universities contribute by supplying talent. This fosters a mutually beneficial partnership between academia and industry.

(4) Expanding Practical Opportunities Through University-Enterprise Cooperation, broaden Students' Internship and Training Opportunities. In the context of industry-university-research integration, financial experiment courses should not only enhance in-class experimental teaching but also encourage students to engage with financial institutions and technology companies. Practical experiences enable students to better understand the application of classroom knowledge and accumulate valuable industry experience, thereby preparing for future employment. Secondly, establish University-Enterprise Joint Training Mechanisms. Through university-enterprise collaboration, targeted talent development programs for the financial industry can be implemented. Enterprises can offer internship positions and job opportunities, while universities provide talent support, fostering two-way interaction.

3.2. Optimizing Teaching Methods to Enhance Students' Practical Skills, Increasing Interactivity and Real-World Problem Analysis

(1) Enhancing interactivity in experiments and using real data for problem analysis. Reform the traditional "teacher-led, student-passive" teaching model by encouraging students to actively participate in experimental design, data analysis, and solution discussions. Approaches such as group collaboration, project-driven learning, and problem-oriented methods can stimulate students' interest, improve their hands-on skills, and

strengthen their ability to solve real-world problems. Second, increase the application of virtual experiments and simulation platforms. Introduce virtual experimental environments and simulated trading platforms to help students conduct financial experiments in a risk-free setting. For example, using financial market simulation software or quantitative trading platforms, students can simulate investments, analyze market trends, and predict risks, thereby enhancing their practical experience. Finally, leverage real data for analysis and forecasting. In comprehensive experimental assessments, students should utilize actual financial market data for their experiments. For instance, they can perform quantitative analysis, risk assessment, or portfolio management using historical stock prices, macroeconomic data, and bank financial data. This approach enables students to understand and apply core tools in finance, fostering their ability to address real-world financial problems.

(2) Reforming the evaluation mechanism for experimental courses to improve overall competency. Li & Wang (2019) point out that implementing a comprehensive evaluation model can assess students' participation, data analysis, problem-solving abilities, and other aspects during the experimental process, thereby providing a more thorough evaluation of their overall competencies. Drawing from their conclusions, this paper proposes a diversified evaluation system for financial experiment courses. Traditional evaluation methods tend to focus solely on students' knowledge acquisition while neglecting their operational skills, innovative thinking, and teamwork capabilities. Therefore, a more comprehensive evaluation system should be designed. In addition to traditional exam scores, assessments should include project presentations, experimental reports, and evaluations of teamwork, fully reflecting students' overall competencies. Moreover, the assessment of practical skills should be strengthened. When evaluating students' learning outcomes, more emphasis should be placed on their performance during experiments, such as problem analysis, data processing, and risk control abilities. These skills directly affect students' practical operational levels and can be assessed through hands-on practice, simulated investments, and problem-solving tasks.

(3) Increasing project-driven assessments to enhance collaborative abilities. According to Jonassen et al. (2008), problem-based learning helps students acquire knowledge by solving real-world problems, while project-based learning improves teamwork, creativity, and the ability to address complex issues. Firstly, implementing project-based assessments. Project-based assessments integrate students' learning tasks with real financial practices. Students, working independently or collaboratively, are required to complete a financial research or investment project. Tasks may include data collection, analysis, modeling, decision-making, and report writing. Topics can involve stock market analysis, risk management, portfolio optimization, or FinTech applications. Secondly, open-ended problem assessments. Exams or experiments should include open-ended questions, requiring students to propose solutions based on real-world financial scenarios. These problems evaluate not only students' understanding of existing knowledge but also their abilities to analyze and solve problems and their innovative thinking.

3.3. Enhancing Faculty Development and Updating Evaluation Methods

(1) Strengthening faculty development to improve teaching

quality. On the one hand, cultivating teachers' industry practice experience is essential. Finance instructors should continuously enhance their practical skills and industry knowledge by engaging in enterprise placements, industry research, and academic collaborations. This allows them to accumulate more practical experience. Teachers should not only deliver theoretical knowledge but also improve the relevance and practicality of their teaching through real-world case studies. On the other hand, inviting industry experts to teach can enrich the curriculum. Experts from the financial sector, including technology specialists and corporate executives, can be invited to give lectures, share industry insights, and guide students on how to apply academic knowledge in the financial field.

(2) Optimizing the evaluation system with a multidimensional comprehensive scoring framework. Firstly, strengthening process-oriented evaluation. Traditional experimental assessments often focus only on final results, overlooking students' learning processes during experiments. Reformed assessments should place greater emphasis on process-oriented evaluations, considering students' performance in data collection, model building, analytical reasoning, and problem-solving throughout the experimental process.

Secondly, teachers can provide regular feedback through interim reviews and staged reports, helping students identify and address shortcomings to improve learning outcomes. Proposing a multidimensional comprehensive scoring system. The new evaluation model should comprehensively assess multiple aspects of students' performance, such as experimental operations, data analysis, problem-solving abilities, innovative thinking, teamwork, and presentation skills. Specific scoring standards can include:

Experimental Operations (20%): Technical skills in conducting experiments and processing data.

Data Analysis and Decision-Making (30%): Competence in data analysis, model design, and application.

Innovation (20%): Novel ideas, methods, and their practical applications in experiments.

Teamwork (10%): Effectiveness of collaboration, communication, and coordination in group projects.

Reports and Presentations (20%): Logical structure, clarity, and quality of written reports, as well as expressiveness in oral presentations.

(3) Establishing a robust evaluation mechanism integrating industry, university, and research. Involving enterprise mentors in assessments. To strengthen the connection between students and the industry, corporate mentors and industry experts can be invited to participate in course evaluations. For instance, during the project design and review stages, enterprise experts can provide suggestions or assign scores, ensuring that the students' work aligns with industry needs. Incorporating real-world scenario assessments. Exams and assessments should simulate real-world industry problems. For example, tasks could involve analyzing the market potential of a financial product or predicting investment opportunities in a specific industry. These practical challenges enable the evaluation of students' abilities to apply theoretical knowledge to real-world financial applications.

Above all, the core of reforming the assessment methods for financial experiment courses lies in emphasizing practicality, innovation, and diversity. The goal is to cultivate financial talents equipped with hands-on skills, innovative

thinking, and the ability to solve complex problems. By strengthening project-driven learning, process-oriented evaluations, teamwork, and interdisciplinary integration, the reformed assessment methods can better align with the development needs of the financial industry while fostering comprehensive improvements in students' overall competencies.

4. Conclusion

This paper focuses on the reform and practice of financial experiment courses in the context of industry-university-research integration. The study finds that while this model has significantly promoted innovation in financial experiment course reform, it still faces challenges in practical implementation. Resource Constraints: The lack of essential resources, particularly financial data platforms and simulation trading systems, limits the depth of experimental teaching. Faculty Development: Teachers require further enhancement of industry experience and interdisciplinary knowledge. Collaboration Mechanisms: Cooperation mechanisms between universities and enterprises need optimization to achieve deeper resource sharing and collaboration.

Future reforms of financial experiment courses must continue to focus on policy support, resource integration, and teacher training. By updating curriculum content, optimizing teaching methods, and strengthening university-enterprise collaboration, the teaching model aims to enhance students' practical skills and innovative thinking. And the core of the reform is to introduce emerging fields such as financial technology, data analytics, and simulation trading, aligning with industry trends to prepare students for complex financial challenges. Through project-based learning, teamwork, and interdisciplinary approaches, the reforms improve students' technical skills while fostering comprehensive qualities and the ability to solve real-world problems.

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