

The Construction and Application of Online and Offline Blended Teaching in Universities of Finance and Economics Based on Virtual Simulation Experiments

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Abstract: In recent years, all colleges and universities in China have begun to implement online teaching. In applied universities of finance and economics, in order to improve students' practical ability and train applied talents with international vision, innovation ability and practical ability, it came into being that the online and offline blended teaching mode based on virtual simulation experiment. Through the analysis of the design concept and construction of the online and offline blended teaching mode based on virtual simulation experiment, it is pointed out that the online and offline blended teaching mode based on virtual simulation experiment has broad application prospects in the education and teaching of universities of finance and economics. On this basis, this paper takes the courses of the School of Economics and Management as an example to discuss the application of the online and offline blended teaching mode based on virtual simulation experiment in the teaching of university courses in finance and economics.

Keywords: Virtual simulation experiment, Online and offline, Blended teaching, Course system

1. Introduction

With the rapid development of information technology and the continuous renewal of educational ideas, modern higher education is undergoing a profound change. In the teaching practice of universities of finance and economics, it has become an important topic in the current teaching reform how to effectively combine theoretical knowledge and practical skills to cultivate high-quality talents with solid professional quality and the ability to solve practical problems. As a cutting-edge and efficient educational technology means, virtual simulation experiment has shown great potential in improving teaching quality and deepening teaching reform by virtue of its unique advantages of highly simulating reality, strengthening practical operation and cultivating innovative thinking.

This paper aims to explore the construction and application of online and offline blended teaching in universities^[1] of finance and economics based on virtual simulation experiments. Firstly, we will theoretically explain the definition of virtual simulation experiment, as well as its wide application status and value in the teaching of universities at home and abroad, especially in finance and economics majors. Secondly, we will analyze the development status of blended teaching in universities of finance and economics, reveal the existing problems and challenges, and the importance of promoting the integration of virtual simulation experiments into the teaching system in this context. Next, based on the specific case of the construction of the course system in the School of Economics and Management, we will provide a detailed interpretation of the design concepts and principles we followed in designing online and offline blended teaching model. Finally, we will conduct in-depth analysis of the specific design and practice of actual course teaching modes, and combine data analysis of teaching effectiveness to verify the significant effectiveness of virtual simulation experiments in promoting blended teaching reform in universities of finance and economics and enhancing the quality of talent-training. Through this study, we hope to provide new perspectives and reference for the education and teaching reform of universities of finance and economics and help China's cause of education of finance and economics further achieve modernization and high-quality development.

2. The Definition and Application of Virtual Simulation Experiment

2.1 The definition of virtual simulation experiment

Virtual simulation experiment is a kind of teaching means to simulate realistic environment by using modern computer technology, network technology and simulation theory. It is based on high-precision model design and constructs a virtual space highly similar to the real world on a computer platform through software systems, allowing learners to operate, make decisions, and experiment in this environment that is just like a real economic management scenario. The core of virtual simulation experiment is that it can simulate the dynamic process of complex system, including market transaction, financial analysis, enterprise management decision and other situations in various financial activities.

Specifically, this experimental approach relies on powerful computer simulation techniques, such as real-time data processing, 3D modeling, artificial intelligence algorithms, etc., and combines the Internet platform to achieve remote access and multi-person collaboration with Internet platforms.^[2] Through the user interface, students can observe the running results of the simulation, perform different actions, and get immediate feedback. Virtual simulation not only reproduces the real processes in the field of economic management, but also allows for exploring the impact of changes in different variables on results in a safe and risk-free environment, thereby deepening the understanding of theoretical knowledge and the mastery of practical skills.

2.2 Its technical characteristics and advantages

Virtual simulation experiment has the following significant technical characteristics and teaching advantages:

Immersive: It uses multimedia and three-dimensional visualization technology to provide realistic visual effects and interactive experience to enhance students' sense of participation and engagement.

Interactive: Students can directly manipulate variables in the virtual environment and interact with simulated objects in real time to achieve independent inquiry and personalized learning.

Reproducible: Experimental conditions and processes can be adjusted at any time and repeated, allowing students to practice repeatedly to verify theories, compare results, and summarize laws.

Safe: It avoids the problems of physical deterioration, environmental pollution and high-risk economic behavior that may exist in traditional laboratories, and creates a learning environment with zero cost and the rear secure for students

Flexible: It is not limited by time and place, supports online and offline blended teaching, and adapts to various learning needs and rhythms.

Compared with traditional experimental teaching methods, virtual simulation experiments are more conducive to cultivating students' innovative thinking, decision-making ability and ability to deal with complex problems, and are also conducive to improving teaching efficiency and teaching quality.

2.3 The application examples in the field of economic management

In the world, more and more courses of finance and economics have introduced virtual simulation experiment as a teaching tool, which has achieved remarkable results. For example, in the field of financial management, some universities have developed a financial decision-making simulation system for enterprises, allowing students to play the role of CFO and simulate practical work scenarios to make investment plans, optimize capital structure and make risk management decisions. In terms of marketing, the virtual marketing platform allows students to plan and implement marketing strategies in a simulated market environment, and evaluate advertising effectiveness, product pricing strategies and market competition through real-time data analysis. In the field of international trade, the virtual simulation experiment of cross-border e-commerce allows students to personally experience the cross-border transaction process, including but not limited to international logistics, customs clearance, foreign exchange settlement, tax planning and other links, which effectively compensating for the shortcomings of on-site internships in covering comprehensive business processes. These cases prove that virtual simulation experiments have become an indispensable part of education of finance and economics, which has far-reaching significance in enhancing students' practical abilities, professional

qualities, and ability to meet workplace needs.

3. The Current Situation of Blended Teaching in Universities of Finance and Economics

3.1 The overview of its development status

With the rapid development of information technology and the continuous renewal of educational ideas, the blended teaching mode of universities of finance and economics has been widely concerned and practiced. At present, it has gradually increased the popularity of blended teaching in universities of finance and economics, and many schools have combined online learning resources and digital tools with traditional classroom teaching to form a diversified, flexible and personalized new teaching mode.

However, while remarkable progress has been made, some problems have also emerged. Firstly, some teachers lack a deep understanding of how to effectively design and implement blended teaching strategies, resulting in insufficient connection between online and offline courses and uneven learning experience for students. Secondly, the ability to develop and integrate educational resources needs to be improved, and it is still relatively scarce that the digital teaching content such as high-quality virtual simulation experiments. Moreover, the technical support system and service guarantee mechanism also need to be further improved to ensure the stable operation and continuous optimization of blended teaching.^[3]

In terms of development trends, blended teaching in universities of finance and economics in the future will pay more attention to personalized training and deep learning, it will be further deepened that the application of advanced technical means such as virtual simulation experiments, the teaching process will be more transparent and traceable, and data driven teaching improvements will become normalized. At the same time, interdisciplinary integration, university-industry cooperation and international exchanges and cooperation will also promote the development of blended teaching to a higher level.

3.2 The degree of integration of virtual simulation experiments in blended teaching

At present, the application of virtual simulation experiment is becoming increasingly common and in-depth in blended teaching of universities of finance and economics. Many colleges and universities have taken virtual simulation experiment as an important practice of economic management, financial investment, financial management, marketing and other related majors. By building simulation environment online, conducting case study and actual combat exercises offline, they have realized the effective docking of theoretical knowledge and practical skills.

At the specific operational level, the virtual simulation experiment platform is not only used in independent experimental courses, but also plays an auxiliary role in the teaching process of some theoretical courses, such as pre-class preview, classroom interaction, after-class review and other links, greatly enriching the content and form of blended teaching. However, the degree of integration of virtual simulation experiments is still different in different universities and majors, and advanced simulation practice courses, such as the application of big data analysis, the artificial intelligence in the financial field, still need further promotion and improvement.

3.3 The effect evaluation of blended teaching

The blended teaching mode introduced virtual simulation experiments has to some extent improved students' learning outcomes and satisfaction. On the one hand, through virtual simulation experiments, students can operate in a highly simulated real scene with their own hands and give immediate feedback, thus deepening their understanding and mastery of professional knowledge and improving their ability to solve practical problems. On the other hand, this innovative teaching method stimulates students' learning interest and initiative, and improves their independent learning ability. From the multidimensional teaching evaluation results, there are significant improvements in many aspects, such as students' exam scores, project completion quality, and employability. At the same time, the questionnaire of students shows that they generally believe that the blended teaching mode and its virtual simulation experiment can enhance the learning experience and is conducive to the cultivation of personal professional quality.

In terms of teachers, most teachers positively affirm the application of virtual simulation experiment

in blended teaching, and believe that it can help make up for the shortcomings of traditional teaching methods in practicality, innovation and flexibility. Meanwhile, they also put forward improvement suggestions on the design of virtual simulation experiment content, technological update and optimization of teaching mode in order to better play the role of virtual simulation experiment in blended teaching of universities of finance and economics in the future.

4. The Construction and Design Concept of Course System of the School of Economics and Management

4.1 The framework construction of course system

In the construction of course system of the School of Economics and Management in universities of finance and economics, it is the key step to integrate and optimize virtual simulation experiment. Firstly, a comprehensive practical teaching system covering core courses of economics and management should be built at the macro level to combine traditional theory teaching with virtual simulation experiment to form a three-tier structure consisting of basic theory courses, professional core courses and practical innovation courses.^[4]

Specifically, in the course of basic theory, through the introduction of basic virtual simulation experiment project, students can initially contact and master the basic principles and operational skills in the field of economic management; In the stage of professional core courses, advanced virtual simulation experiment modules are designed in combination with professional characteristics and industry development trends, such as financial market simulation trading and enterprise strategic decision-making simulation, etc., to strengthen students' professional quality and practical ability; Finally, in practical innovation courses, students are encouraged to participate in interdisciplinary comprehensive virtual simulation experiments or innovation and entrepreneurship projects to cultivate their ability to solve complex problems and cope with future challenges.

4.2 The positioning of virtual simulation experiments in the course system

Virtual simulation experiment plays an important role in the whole curriculum. It is not only an effective extension of theoretical knowledge, but also an important carrier to improve students' practical ability and innovation ability. In the course system, the virtual simulation experiment should be closely combined with the theoretical course and they complement each other to form a spiraling learning path of "theory guidance - experiment verification - reflection and summary". On the one hand, virtual simulation experiment is a vivid reproduction of and deep expansion of theoretical course content. By simulating real-life situations, students can understand and apply the theoretical knowledge they have learned in practice, achieving the unity of knowledge and action. On the other hand, the large amount of data and case analysis generated in the process of virtual simulation experiment can feed back theoretical teaching to enrich classroom teaching content and promote students' in-depth understanding and flexible application of theoretical knowledge.

4.3 The design concept and principle

The construction of blended teaching mode based on virtual simulation experiment should follow the following core teaching concepts and principles:

Personalized learning: Teachers should respect the individual differences of students, provide customized learning resources and diversified experiment scenes, meet the learning needs of different students to stimulate their internal motivation.

Deep participation: Students are encouraged to actively participate in virtual simulation experiments. Through role-playing and decision-making simulation, students are encouraged to devote themselves to the learning process to improve their ability to explore and solve problems independently.

Situational experience: The use of virtual simulation experiments to simulate the real economic management environment is to create an immersive learning atmosphere, so that students can enhance professional cognition and emotional resonance in personal experience.

Collaborative interaction: With the help of the network platform to achieve online and offline integration, teachers and students are encouraged to communicate and collaborate with others in real time and jointly explore and solve practical problems.

Continuous feedback and improvement: Relying on the data recording and analysis function of virtual simulation experiment, real-time assessment and feedback of students' learning results are carried out to guide teachers to adjust teaching strategies and achieve continuous improvement and optimization of teaching effects.

5. The Design and Practice of Course Teaching Model and Its Effect Analysis

5.1 The design of teaching mode

In the construction of online and offline blended teaching in universities of finance and economics based on virtual simulation experiments, we have carefully designed a set of teaching modes combining online resource construction, offline interactive links and virtual laboratory operation process.

Firstly, in terms of online resource construction, we developed and integrated a series of high-quality virtual simulation experiment projects about economic management and uploaded them to the online education platform of the school. These experiment projects include, but are not limited to, simulated trading in financial markets, simulation of corporate strategic decisions, analysis and forecasting of financial statements, etc. Each experiment is accompanied by detailed video tutorials, study guides and the explanation of supporting theoretical knowledge. Secondly, offline interaction is mainly reflected in three aspects: classroom discussion, group cooperation and teachers^[5] guidance. The teacher guides the students to preview the online virtual simulation experiment before class, conduct in-depth discussion in class, and analyze the key points and difficulties in the experiment process; At the same time, students are encouraged to form a team and jointly participate in virtual simulation experiments to develop collaboration and communication skills; Teachers regularly organize Q&A sessions to provide personalized solutions and feedback for students' problems encountered during the virtual experiment. Thirdly, the virtual laboratory operation process mainly includes login verification, experiment selection, scenario simulation, data analysis, report submission and other steps. Students can visit the virtual laboratory anytime and anywhere through the campus network, complete the experimental operation independently according to the stated task requirements, view the results in real time and share with classmates. In addition, the system also has an automatic scoring function to quantitatively evaluate students' performance in each experiment, so that teachers can understand students' learning progress and mastery in knowledge.

5.2 Effect analysis and reflection

Through the systematic analysis of teaching data, it is found that after this blended teaching mode is adopted, the understanding and application ability of students have significantly improved in professional knowledge of finance and economics, and their final examination scores and various skills competition results have been significantly improved. In addition, the students' innovative ability has also been exercised, and many students have put forward novel and unique solutions in the virtual simulation experiment, showing good problem-solving ability and innovative thinking.

However, the teaching evaluation shows that although it is good that the overall effect of this teaching model, there is still some room for improvement. For example, some students have reported that online resources are abundant but difficult to use, and there is a need to further simplify the operation process and enhance the user experience. In addition, offline interactive sessions should focus more on developing students' critical thinking and interdisciplinary perspectives to encourage them to understand and apply what they have learned from a broader perspective.

6. Conclusion

By systematically reviewing the definition and application of virtual simulation experiment and its important role in blended teaching in universities of finance and economics, this study deeply analyzes the current development status of blended teaching in universities of finance and economics, and elaborates in detail the design concept and specific practice that we uphold when constructing online and offline blended teaching mode by combining the construction example of the curriculum system of the School of Economics and Management. In summary, the construction of online and offline blended teaching in universities of finance and economics based on virtual simulation experiments not only conforms to the trend of The Times of educational informatization, but also is an effective way to

deepen the teaching reform of higher education and meet the social demand for high-quality composite talents in finance and economics. However, we also recognize that in the process of promoting and optimizing this teaching model, there is still a need to continue to pay attention to technology update, teacher training, teaching quality monitoring and other issues to ensure that the blended teaching model is scientific, feasible and effective. In the future, we will continue to explore and perfect the application of virtual simulation experiments in the teaching of universities of finance and economics, and contribute to the modernization of China's cause of financial education.

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