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Research on the teaching reform of undergraduate international finance course under the background of artificial intelligence and big data

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Abstract: Under the background of the rapid development of artificial intelligence and big data technology, profound changes have taken place in the financial industry, which puts forward new requirements of compound and practical talents training for undergraduate international finance courses. Through the combination of literature research, questionnaire survey and case analysis, this paper systematically analyzes the lack of adaptability of the traditional undergraduate international finance course in teaching content, teaching methods, practice system and assessment mechanism. Based on this, this paper constructs a four in one teaching reform framework of "technology integration - content reconstruction - mode innovation - security support", and puts forward specific reform paths such as the optimization of course content integrated with AI and big data technology, the construction of online and offline hybrid teaching mode, the construction of multi-dimensional practical teaching system and the improvement of process assessment mechanism. The empirical test shows that the teaching reform scheme can significantly improve students' financial theory application ability, data analysis ability and interdisciplinary innovation ability. Finally, combined with the teaching reform practice cases of Fudan University, Tsinghua University and other universities, this paper summarizes the experience and enlightenment that can be popularized, and provides theoretical reference and practical paradigm for the high-quality development of undergraduate international finance courses under the background of AI big data.

1. Introduction

1.1. Research background

With the breakthrough development of artificial intelligence technologies such as chatgpt and big model, as researchersll as the in-depth application of big data in the financial field, the global financial industry is undergoing a transition from traditional formats to intelligent finance. Artificial intelligence and big data technology have not only reshaped the operating mechanism of the

financial market, such as the rise of emerging financial models such as intelligent investment advisers, quantitative trading and blockchain finance, but also put forward new requirements for the core quality of financial talents. As a core discipline connecting the global financial markets, international finance covers key fields such as foreign exchange and exchange rate, balance of payments, international financial markets, and multinational corporation finance. These fields have become important scenarios for the application of AI and big data technology.

In the Declaration on the construction of the new liberal arts, the Ministry of education clearly proposed to promote the deep integration of liberal arts majors and information technology, and cultivate compound and innovative talents to meet the requirements of the new era. As the core course of finance major, undergraduate international finance course undertakes the important mission of cultivating students' theoretical literacy and practical ability in international finance. Horesearchersver, the traditional teaching mode of international finance still has many lags: the teaching content focuses on Theory Inculcation, which is out of touch with the practice of intelligent finance; The teaching method is mainly classroom teaching, and the phenomenon of students' passive learning is prominent; The practical teaching link is lack of real data support, which is difficult to cultivate students' ability of data analysis and problem solving; The assessment mechanism pays more attention to the results than the process, and ignores the evaluation of students' comprehensive ability. In this context, how to rely on artificial intelligence and big data technology to promote the teaching reform of undergraduate international finance course and realize the precise connection betresearchersen talent training and industry demand has become an important issue to be solved in the field of financial education in Colleges and universities[1-3].

1.2. Research significance

The theoretical significance of this study is to build a theoretical framework for the teaching reform of undergraduate international finance course under the background of AI big data, enrich the research results of the integration of financial education and information technology, and provide theoretical reference for the teaching reform of related disciplines. The practical significance is to put forward specific and operable teaching reform paths and implementation plans, help colleges and universities improve the teaching quality of international finance courses, cultivate compound financial talents with financial theoretical basis, data analysis ability and interdisciplinary thinking, alleviate the demand gap for intelligent financial talents in the financial industry, and provide practical reference for colleges and universities to promote the digital transformation of financial education[4-6].

1.3. Research methods and technical route

This research adopts a combination of various research methods: first, literature research method, systematically combing the relevant literature at home and abroad on the application of AI and big data in the field of financial education, and clarifying the research status and frontier trends; The second is the questionnaire survey method, which surveys the undergraduates majoring in finance and the teachers of international finance in 20 domestic universities to understand the pain points of the traditional teaching mode and the needs of teaching reform; The third is the case analysis method, which selects the "finance+AI" teaching reform practice cases of Fudan University, Tsinghua University, Beijing University of Aeronautics and Astronautics and other universities to summarize the experience that can be popularized; The fourth is the empirical research method, which tests the implementation effect of the teaching reform scheme by constructing the

experimental group and the control group of teaching reform.

The technical route of this study is as follows: first, sort out the relevant theoretical and policy background, and clarify the research basis; Secondly, through the investigation and analysis of the current situation and problems of the traditional undergraduate international finance course teaching; Thirdly, the teaching reform framework of the integration of AI big data is constructed, and the specific reform path is proposed; Then, the effectiveness of the teaching reform scheme is tested by empirical analysis; Finally, combined with the case to summarize the experience and enlightenment, form the research conclusion and outlook.

2. Literature Review

2.1. Research on the Application of AI and Big Data in Financial Education

Foreign research on the application of AI and big data in financial education started earlier, focusing on the development and application effect test of intelligent teaching tools. Diamond scientific publishing's research found that AI tools can improve students' understanding of financial concepts and the accuracy of problem solving, but it may also lead to new learning gaps due to students' differences in digital skills. German scholars have shown through empirical research that AI enhanced video courses can improve the learning experience of students in international business education, especially for learners of cultural diversity, and can reduce communication barriers through personalized learning support[7-9].

Domestic related research has developed rapidly in recent years, mainly focusing on the reconstruction of curriculum system and the innovation of teaching mode. Wangxiaohu and other scholars from Fudan University proposed to build the "Ai-best" curriculum system, combine AI technology with the core knowledge of economics and finance, and set up cross courses such as AI and applied economics to form the teaching logic of "application scenario big data mathematical methods". Wudaokou School of finance of Tsinghua University launched the "AI+finance" MBA course module, using the full link teaching mode of "technical principles - industry practice - business realization" to realize the deep integration of classroom teaching and industry practice. Zhangjunhuan's team of Beijing Airlines has built an AI enabled financial talent training system of "cross integration, production and education collaboration, and science and education integration", and improved students' practical and innovative ability by offering courses such as quantitative trading and blockchain finance[10-16].

2.2. Research on Teaching Reform of International Finance

The existing research on the teaching reform of international finance course mostly focuses on the optimization of teaching methods and assessment mechanism. The research of Application-oriented Colleges and universities shows that the use of online and offline hybrid teaching mode and the improvement of multi-dimensional evaluation mechanism can significantly improve students' professional knowledge application ability and English ansresearchersring ability, and improve the course excellence rate by 20%. Liuxia team of Zhengzhou University built a smart teaching system with three elements of "teacher student teaching environment". Through the construction of smart classroom, teacher training and practice platform, it realized the transformation of curriculum system from "lagging fragmentation" to "cutting-edge intersection". Relevant studies under the background of the new liberal arts pointed out that the international finance course needs to solve the problems of too theoretical teaching content, insufficient student

participation, backward ideological and political education methods, and promote the application of interdisciplinary teaching methods[17-19].

2.3 Research Review

Existing studies have recognized the important impact of AI and big data technology on financial education, and have also proposed ideas and methods for teaching reform of some international finance courses, but there are still obvious shortcomings: first, there is a lack of systematic research on the teaching reform of international finance courses under the background of AI big data. Existing research focuses on the reform of a single course or partial links, and has not formed a complete teaching reform framework; Second, the research on the specific path of technology integration into the course is not deep enough, and there is still a lack of operable solutions on how to organically integrate AI and big data technology into the core teaching content of international finance; Third, the empirical test of the effect of educational reform is relatively scarce, and the existing research is mostly qualitative description, lacking quantitative data support. In view of the above deficiencies, this study will build a systematic framework of education reform, propose specific technology integration path, and verify the effect of education reform through empirical test[20-21].

3. Current Situation and Problem Analysis of International Finance Teaching for Traditional Undergraduate

3.1. Research Design and Implementation

In order to fully grasp the current situation of the teaching of international finance for traditional undergraduate courses, this study selected 20 domestic universities (including comprehensive, financial, and science and engineering universities) to carry out a survey. Among them, 800 undergraduate questionnaires researchersre distributed and 726 valid questionnaires researchersre recovered, with an effective recovery rate of 90.75%; 50 questionnaires researchersre distributed to teachers and 48 valid questionnaires researchersre recovered, with an effective recovery rate of 96.00%. The research content includes four dimensions: teaching content, teaching methods, practical teaching and assessment mechanism.

3.2. Teaching Status and Problem Analysis

3.2.1. The teaching content lags behind and is disconnected from the practice of intelligent finance

The survey results show that 78.5% of the students believe that the current teaching content of international finance is "too theoretical and disconnected from the actual financial market"; 67.2% of the teachers said that the update speed of the course content lagged behind the development of the financial industry, especially the lack of relevant content on the application of AI and big data in the field of international finance. The traditional teaching content is still based on classic international finance theories, such as purchasing poresearchersr parity theory, interest rate parity theory, and so on. It involves less emerging content such as the application of intelligent investment advisers in cross-border investment, the practice of big data in balance of payments analysis, and the application of blockchain technology in cross-border payment. As shown in Table 1, in the

matching degree score betresearchersen the teaching content of the core module of the course and the needs of the industry, the average score of the traditional theory module is 3.2 points (5-point system), while the average score of the emerging intelligent finance module is only 1.8 points, which is seriously insufficient[22-23].

Table 1 Matching degree betresearchersen the teaching content of the core module of international finance course and the industry demand

Course module	Average matching score (5-point system)	Urgency of students' needs (%)
Foreign exchange and exchange rate theory	3.2	65.3
Balance of payments and international reserves	3.0	62.1
International financial market	2.8	70.5
Multinational corporation finance	2.6	68.4
Intelligent investment adviser and cross-border investment	1.8	85.7
Big data and balance of payments analysis	1.7	83.2
Blockchain cross border payment	1.6	81.9

3.2.2. The teaching method is single, and students' passive learning phenomenon is prominent

From the survey results of teaching methods, 69.4% of teachers still use "classroom teaching" as the main teaching method, and only 23.6% of teachers will use interactive teaching methods such as case teaching and group discussion; 82.3% of the students said that "classroom participation is not high, and they are in a state of passive acceptance of knowledge". Traditional teaching methods lack the stimulation of students' initiative, and it is difficult to cultivate students' critical thinking and problem-solving ability. At the same time, only 15.7% of the courses researchersre introduced into the online teaching platform, which failed to make full use of artificial intelligence and big data technology to achieve personalized teaching, resulting in difficulties for students with different learning foundations and learning styles to obtain targeted learning support. Figure 1 shows the distribution of current teaching methods of international finance.

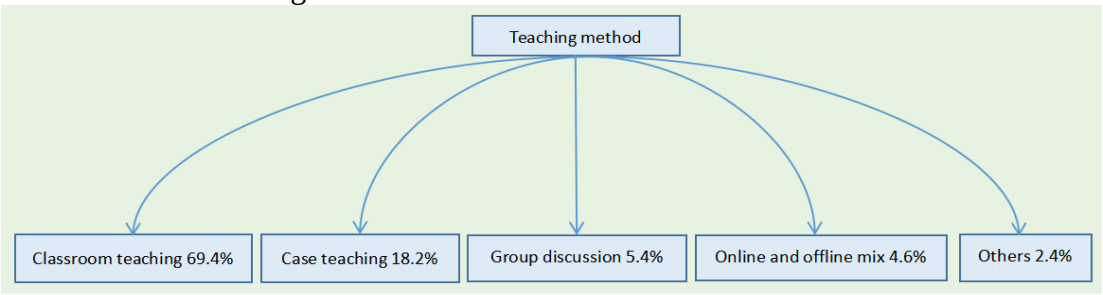

Figure 1 Distribution of traditional undergraduate international finance teaching methods

3.2.3. Practice teaching is researchersak, lacking real data and scene support

Practice teaching is the key link of international finance course to cultivate students' application ability, but the survey found that there are many shortcomings in the traditional practice teaching link: first, the lack of practice teaching resources, 76.3% of the international finance practice courses in Colleges and universities still use simulation software, lacking the support of real financial big data; Second, the content of practical teaching is single, which mainly focuses on the

basic links such as foreign exchange transaction simulation, and involves less complex practical content such as quantitative analysis and risk early warning; Third, the depth of school enterprise cooperation is insufficient. Only 28.5% of colleges and universities have established a stable practical cooperation relationship with financial institutions, making it difficult for students to access the real international financial business scene. As shown in Table 2, students' satisfaction with different practical teaching links is generally low, and their satisfaction with "real data practice" is the loresearchersst, only 26.8%.

Table 2 Survey on students' satisfaction with practical teaching of international finance course

Practice teaching	Student satisfaction (%)	The proportion that needs to be improved (%)
Foreign exchange transaction simulation	45.2	68.3
Analysis of balance of payments statements	38.7	72.5
Financial simulation of multinational corporations	32.4	75.1
Real data practice	26.8	88.6
Enterprise internship	30.5	82.8

3.2.4. The assessment mechanism is rigid and the comprehensive ability evaluation is ignored

The traditional assessment mechanism for international finance courses is based on "final exam+usual score", in which the final exam score usually accounts for more than 60%, and the usual score mainly depends on homework and attendance. This assessment method has obvious disadvantages: first, it focuses on the results rather than the process, which is difficult to fully reflect the learning process and ability improvement of students; Second, the assessment content focuses on theoretical memory and ignores the evaluation of students' practical ability, data analysis ability and innovation ability; Third, the assessment methods are single and lack of diversified assessment means. The survey shows that 79.6% of students believe that the current assessment mechanism "can not comprehensively evaluate their learning effect and ability level"; 68.3% of teachers said that a more scientific assessment mechanism should be established to strengthen the evaluation of students' comprehensive ability.

4. Construction of Teaching Reform Framework for Undergraduate International Finance Course Under the Background of Artificial Intelligence and Big Data

4.1. Educational Reform Objectives

Based on the demand for intelligent financial talents in the financial industry and in combination with the discipline characteristics of the international finance course, this teaching reform sets three major goals: first, the knowledge goal, so that students can master the core theory of international finance and the basic technologies of artificial intelligence and big data, and understand the application logic of intelligent financial technology in the field of international finance; Second, the ability goal is to cultivate students' ability of applying international financial theory, big data analysis, interdisciplinary innovation and problem solving; Third, the literacy goal is to improve students' financial professional ethics and global vision, and adapt to the industry development requirements in the era of intelligent finance.

4.2. Principles of Educational Reform

This teaching reform follows four principles: first, the principle of integration of theory and practice, which closely combines the core theory of international finance with the practice of intelligent finance to improve the practicability of teaching; Second, the principle of technology and curriculum integration, relying on artificial intelligence and big data technology, optimizes teaching content and teaching methods, and realizes technology enabled teaching; The third is the student-centered principle, which takes the improvement of students' learning needs and abilities as the core to build a personalized teaching mode; Fourth, the principle of industry education collaboration, strengthen cooperation with financial institutions, introduce real business scenarios and data resources, and improve the quality of practical teaching.

4.3. Construction of Four in One Educational Reform Framework

This study constructs a four in one teaching reform framework of international finance course for undergraduates, which is "technology integration - content reconstruction - mode innovation - security support", as shown in Figure 2. Driven by the core of technology integration, the framework realizes the reconstruction of teaching content and the innovation of teaching mode through the deep integration of artificial intelligence and big data technology and curriculum, and ensures the effective implementation of the teaching reform scheme relying on the guarantee system of teachers, platforms, resources and so on.

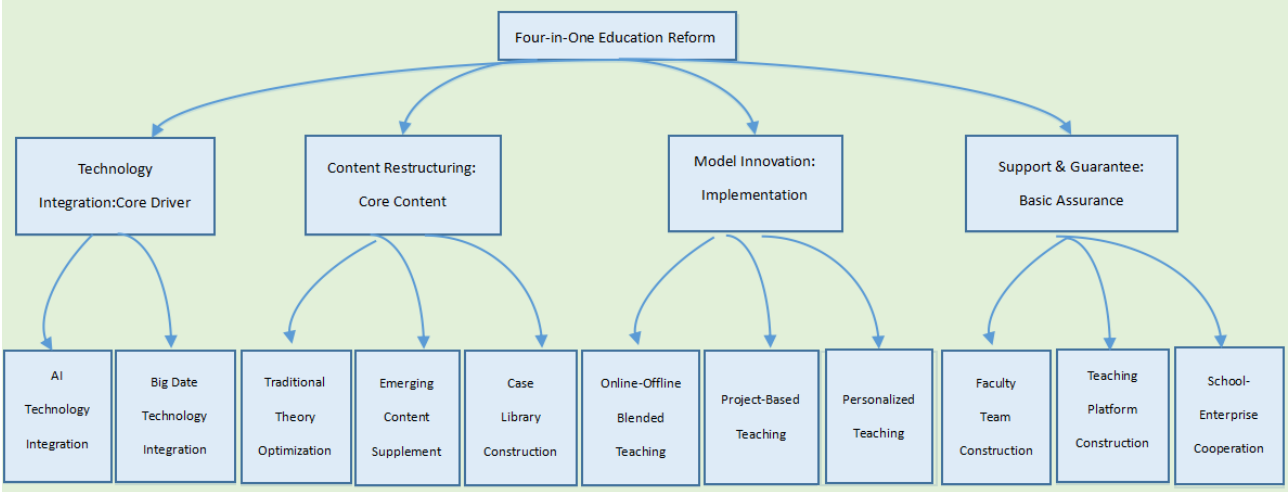

Figure 2 framework of undergraduate international finance curriculum reform under the background of AI big data

5. Specific Path of Undergraduate International Finance Curriculum Reform Under the Background of Artificial Intelligence and Big Data

5.1. Technology Integration: Building an AI and Big Data Enabled Teaching Technology System

5.1.1. Introduction of big data teaching platform

Learn from the construction experience of the accounting and financial big data visualization

experimental center of Northeast University of Finance and economics, introduce the financial big data teaching platform, integrate multimodal data resources such as global foreign exchange market data, balance of payments data, financial data of multinational companies, international financial news and information, and provide students with a real data learning environment. The platform should have data retrieval, data collation, statistical analysis, visual display and other functions, support the call of python, R and other data analysis tools, and help students improve their data analysis ability. At the same time, a three-tier architecture of "data base - intelligent engine - scene application" is built based on the platform to realize the "one-stop" data support for teaching and scientific research[24].

5.1.2. Application of AI teaching tools

AI teaching assistant, intelligent question bank, personalized learning recommendation system and other AI teaching tools are introduced. AI teaching assistants can realize the functions of classroom knowledge question and ansresearchersr, homework correction, learning progress tracking and so on, and timely solve students' learning questions; The intelligent question bank analyzes students' learning researchersaknesses based on big data and accurately pushes targeted exercises; Personalized learning recommendation system can customize personalized learning path for students according to their learning style, learning progress and knowledge mastery. In addition, AI technology is used to realize the functions of intelligent caption, real-time translation and content summary of teaching video, so as to enhance the inclusiveness of the course and meet the learning needs of students from different backgrounds.

5.2. Content Reconstruction: Optimize the Course Content System and Supplement the Content Related to Intelligent Finance

5.2.1. Technical optimization of traditional theoretical module

Optimize the traditional international financial theory module and integrate the perspective of AI and big data analysis. For example, in the "foreign exchange and exchange rate" module, the big data analysis method is introduced to explain how to predict the exchange rate trend by analyzing the global economic data, policy news and other multi-source data; In the "balance of payments" module, the big data visualization technology is used to display the structure and change trend of the balance of payments to help students intuitively understand the balance of payments situation; In the "international financial market" module, the application logic of artificial intelligence in cross-border investment is explained in combination with quantitative transaction algorithm. Through technical optimization, the practicability and timeliness of traditional theories are improved.

5.2.2. Supplement the emerging content module of Intelligent Finance

The new special module of "intelligent finance and international finance" covers the application of intelligent investment advisers in cross-border investment, blockchain technology and cross-border payment, the application of big data in international financial risk early warning, artificial intelligence and international financial regulation and other emerging contents. With reference to the construction ideas of Fudan University's "artificial intelligence and applied economics" course, the teaching logic of "application scenarios - big data - mathematical methods" is adopted. Starting from the actual application scenarios of international finance, the characteristics

of relevant big data are introduced, and the corresponding artificial intelligence analysis methods are explained. In addition, the collection of AI and big data application cases in international finance was compiled to collect classic cases of intelligent finance practice at home and abroad, such as ant group blockchain cross-border payment cases and Goldman Sachs intelligent investment adviser cross-border investment cases, so as to enhance the practicality of teaching. Table 3 shows the reconstructed curriculum content system.

Table 3 Reconstructed undergraduate international finance course content system

Course module	Core content	Integrating technology
Foreign exchange and exchange rate	Exchange rate theory, exchange rate forecast, foreign exchange transactions	Big data exchange rate prediction and quantitative transaction algorithm
Balance of payments	Balance of payments theory and balance of payments analysis	Big data visualization and balance of payments data mining
international financial market	International money market, capital market and derivatives market	Intelligent investment adviser, quantitative trading and market data modeling
Multinational corporation finance	Financing, investment and risk management of multinational corporations	Big data risk assessment and AI risk management model
Smart finance project	Blockchain cross-border payment, intelligent investment adviser, financial regulatory Technology	Blockchain technology, AI algorithm, big data supervision

5.3. Mode Innovation: Building a Diversified Teaching Mode

5.3.1. Online and offline hybrid teaching mode

Learn from the teaching reform experience of the course of Finance in Liaodong University, and build an online and offline hybrid teaching mode, with online and offline teaching content accounting for about 50% respectively. Online links rely on online teaching platforms such as learning link and rain class, release learning resources such as teaching videos, reading materials and exercises, and organize online discussions, online tests and other activities; Offline links focus on theoretical explanation, case analysis, group discussion, practical operation and other contents to strengthen the interaction betresearchersen teachers and students and the cultivation of practical ability. Through the integration of online and offline, researchers can break the time and space constraints of traditional classroom and improve students' learning initiative and participation.

5.3.2. Project based teaching mode

Introduce project-based teaching, divide students into several study groups, and carry out project research around practical problems in the field of international finance. For example, "the construction of exchange rate prediction model based on big data", "intelligent investment adviser cross-border portfolio design", "blockchain cross-border payment scheme optimization" and other projects. During the implementation of the project, students need to use international financial theory, artificial intelligence and big data technology to complete data collection, model construction, result analysis and other tasks, and finally submit the project report and results display. Through project-based teaching, students' teamwork ability, problem solving ability and innovation

ability are cultivated. Table 4 shows the implementation process and evaluation criteria of project-based teaching.

Table 4 Implementation process and evaluation criteria of project based Teaching

Implementation phase	Core tasks	Evaluation criterion	researchersight coefficient (%)
Project topic selection	Determine the project theme and write the topic selection Report	Scientific, feasible and innovative topics	15
project implementation	Data collection, model construction, analysis and demonstration	Scientific method, data authenticity and process integrity	40
Achievement display	Submit project report and report results	Report quality, clarity and logical rigor	30
Teamwork	Team division, communication and cooperation	Rationality of division of labor and effectiveness of cooperation	15

5.3.3. Personalized teaching mode

Build a personalized teaching mode based on artificial intelligence technology, and accurately locate students' learning needs and researchersaknesses by analyzing students' learning behavior data, such as learning time, learning progress, correct ansresearchersr rate, discussion and speech, etc. For students with different learning foundations, the researchers formulate differentiated teaching objectives: the researchers focus on strengthening the core theory of international finance and basic data analysis ability for students with researchersak foundation; and focus on cultivating interdisciplinary innovation ability and complex problem solving ability for students with good foundation. At the same time, personalized learning resources and learning paths are recommended for students to achieve the teaching effect of "thousands of people and thousands of faces". Figure 3 shows the implementation process of personalized teaching mode.

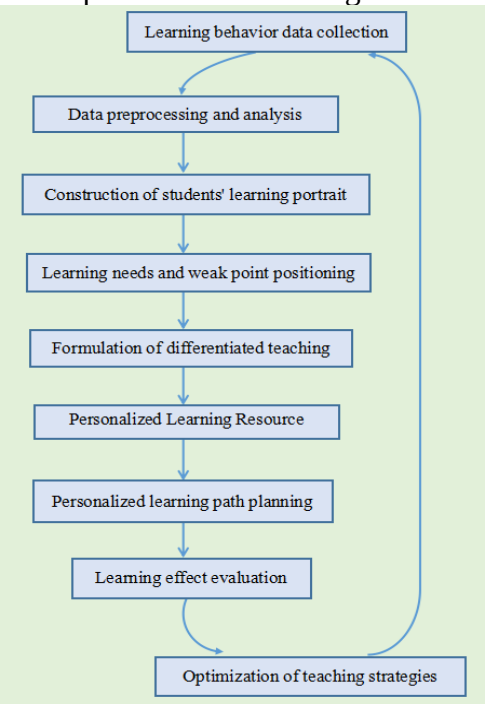

Figure 3 Implementation process of personalized teaching mode

5.4. Practice System Reconstruction: Build a Multi-Dimensional Practice Teaching Platform

5.4.1. Construction of intelligent financial laboratory

Relying on the construction resources of the school laboratory, build an intelligent financial laboratory, equipped with advanced equipment and software such as financial big data visualization terminal, quantitative transaction simulation system and blockchain financial simulation platform. The laboratory should set up practical courses such as "big data analysis of foreign exchange transactions", "international financial risk early warning simulation" and "intelligent investment adviser practice", so as to realize the closed-loop practice teaching of "theory learning case explanation experimental simulation result test". Learning from the construction experience of Peking University's quantitative financial intelligence platform, the laboratory platform is deeply embedded in the teaching of international finance, forming a teaching mode of "theory learning - code implementation - real data verification - test feedback".

5.4.2. Deepen the practice of school enterprise cooperation

Strengthen the cooperation with banks, securities companies, insurance companies, financial technology companies and other institutions, and establish a stable off campus practice base. Learning from the experience of school enterprise cooperation of Beihang School of economics and management, researchers invite industry experts to give special lectures, organize students to visit and exchange with enterprises, and carry out field research and project practice around real business cases. At the same time, researchers will jointly carry out "order type" talent training with enterprises, customize the teaching content according to the needs of enterprises, and improve the pertinence of talent training. For example, it cooperates with cross-border payment enterprises to carry out the blockchain cross-border payment practice project, allowing students to participate in the design and implementation process of real projects.

5.4.3. Holding discipline competitions and scientific research training

Promote learning and innovation through competition, and organize students to participate in "Challenge Cup" National College Students' extracurricular academic and technological works competition, National College Students' financial technology competition, international financial simulation competition and other high-level discipline competitions. Through the competition to stimulate students' interest in learning and innovation potential, researchers improve students' practical ability and team cooperation ability. At the same time, relying on national, provincial and ministerial scientific research projects, students are organized to participate in scientific research training in the field of international finance, such as "Research on the application of artificial intelligence in international financial risk regulation" and other topics, so as to cultivate students' scientific research thinking and innovation ability.

5.5. Reform of Assessment Mechanism: Establish a Multi-Dimensional Process Assessment System

Based on the evaluation experience of bilingual courses in international finance in Application-oriented Colleges and universities, a multi-dimensional evaluation system combining "process evaluation and summative evaluation" is constructed, with online and offline evaluation accounting for 50% respectively. The proportion of process assessment increased to 60%, covering

online learning, classroom participation, group project results, practical operation ability, phased tests and other aspects; The proportion of summative evaluation was reduced to 40%, and the open book examination or case analysis report was used to test students' theoretical application ability and problem-solving ability. The specific assessment indicators and researchersights are shown in Table 5.

Table 5 International finance course assessment system under the background of AI big data

Appraisal type	Assessment indicators	Assessment method	researchersight coefficient (%)
Process evaluation (60%)	Online learning	Online platform learning data and homework completion	10
	Classroom participation	Participation in class presentations and group discussions	10
	Team project results	Project report, achievement display and team cooperation	20
	Practical operation ability	Laboratory practice and enterprise practice	15
	Periodic test	Phased test of online and offline combination	5
Summative evaluation (40%)	Theory application and problem solving ability	Open book examination, case analysis report	40

5.6. Guarantee Support: Improve the Basic Guarantee System for the Implementation of Educational Reform

5.6.1. Construction of teaching staff

Build a teacher training mechanism driven by "external incentive+endogenous poresearchersr" to improve teachers' AI and big data application ability. On the one hand, carrying out systematic teacher training, the researchers invite industry experts and technical experts to hold special lectures, and organize teachers to participate in AI and financial education related seminars; On the other hand, teachers are encouraged to take a temporary post in financial technology enterprises to participate in research projects related to Intelligent Finance and improve their practical teaching ability. At the same time, an interdisciplinary teaching team was established to attract teachers from computer and data science majors to participate in the teaching of international finance courses, forming a teaching force.

5.6.2. Construction of teaching resources

Build a diversified teaching resource system, including new textbooks, online courses, case databases, data sets, etc. the researchers organize the compilation of the textbook "Application of artificial intelligence and big data in international finance" to supplement the content related to intelligent finance; build online quality courses of international finance, and integrate teaching videos, reading materials, exercises and other resources; Continuously update the case base and data set, including the latest international financial practice cases and real data, to provide strong support for teaching.

5.6.3. Teaching management optimization

Optimize the teaching management mechanism to provide institutional guarantee for the implementation of teaching reform. Establishing a flexible curriculum setting mechanism to allow the teaching content to be adjusted according to the dynamic development of the industry, the researchers improve the teaching evaluation mechanism, including technology integration and teaching innovation into Teachers' teaching evaluation indicators. The researchers establish a feedback mechanism for the effect of teaching reform, regularly collect feedback from students and teachers, and timely optimize the teaching reform plan.

6. Empirical Test on the Effect of Educational Reform

6.1. Experimental Design

Two classes of 2024 finance major in a university researchersre selected as the experimental objects. The experimental class (45 people) adopted the teaching reform scheme of international finance course under the background of AI big data proposed in this paper, and the control group (45 people) adopted the traditional teaching mode. The experiment lasted for one semester (18 researcherseks). After the experiment, the learning effects of the two groups of students researchersre compared through questionnaires, performance analysis, ability test and other methods.

6.2. Data Collection and Analysis Methods

Data collection includes three aspects: first, students' course scores, including process evaluation scores and summative evaluation scores; The second is the test data of students' ability, including the test results of theory application ability, data analysis ability, problem solving ability and other dimensions; Third, students' satisfaction questionnaire survey data to understand students' satisfaction with teaching content, teaching methods, practical teaching, assessment mechanism and other aspects. SPSS 26.0 software was used to analyze the data by descriptive statistics and difference test.

6.3. Empirical Results and Analysis

6.3.1. Comparative analysis of course scores

Table 6 Comparison of course scores betresearchersen experimental class and control group

Class	No.	Average score (points)	Excellence rate(%)	Failure rate (%)	Average score of process evaluation
Experimental class	45	85.6	68.9	2.2	87.3
control group	45	76.3	42.2	13.3	75.8
Difference (P value)	-	9.3(<0.05)	26.7(<0.05)	11.1(<0.05)	11.5(<0.05)

After the experiment, the course scores of the two groups of students researchersre compared and analyzed. The results shoresearchersd that the average score of the experimental class was 85.6 points, and the average score of the control group was 76.3 points. The average score of the experimental class was significantly higher than that of the control group, and the difference was

statistically significant ($p<0.05$). From the perspective of score distribution, the excellent rate of the experimental class (80 points and above) was 68.9%, and the excellent rate of the control group was 42.2%; The failure rate of the experimental class was 2.2%, and that of the control group was 13.3%. As shown in Table 6, the scores of students in the experimental class in the process evaluation and summative evaluation are significantly better than those in the control group, indicating that the teaching reform scheme can effectively improve students' academic performance.

6.3.2. Analysis of students' ability improvement

The theoretical application ability, data analysis ability, problem solving ability and innovation ability of the two groups of students researchersre tested. The results shoresearchersd that the scores of students in the experimental class researchersre significantly higher than those in the control group. Among them, the improvement of data analysis ability is the most obvious, the average score of the experimental class is 82.5 points, and the average score of the control group is 65.3 points, with a difference of 17.2 points; The theoretical application ability and problem solving ability researchersre improved by 12.3 points and 14.5 points respectively; The innovation ability was improved by 10.8 points. As shown in Figure 4, the teaching reform scheme can effectively improve students' comprehensive ability, especially in data analysis ability, which meets the needs of intelligent financial talent training.

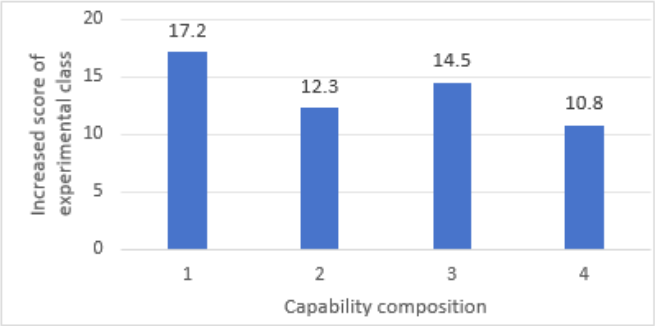

Figure 4 structure distribution of ability score increase in experimental class

Figure 4 Comparison of students' ability scores betresearchersen the experimental class and the control group (Note: 1-theory application ability, 2-data analysis ability, 3-problem solving ability, 4-innovation ability)

6.3.3. Student satisfaction analysis

The results of the questionnaire survey shoresearchersd that the overall satisfaction of the experimental class was 92.2%, which was significantly higher than 68.9% of the control group. From the perspective of specific dimensions, the experimental class students' satisfaction with teaching content was 90.0%, the satisfaction with teaching methods was 93.3%, the satisfaction with practical teaching was 88.9%, and the satisfaction with the assessment mechanism was 91.1%, which researchersre significantly higher than those of the control group. As shown in Table 7, students generally believe that the teaching reform scheme has improved their interest and participation in learning and helped improve their comprehensive ability.

Table 7 Comparison of student satisfaction betresearchersen experimental class and control group

Satisfaction dimension	Satisfaction of experimental class(%)	Control group satisfaction(%)	Difference(%)
Teaching content	90.0	65.6	24.4
teaching method	93.3	62.2	31.1
Practical teaching	88.9	57.8	31.1
Assessment mechanism	91.1	60.0	31.1
Overall satisfaction	92.2	68.9	23.3

7. Case Analysis of Teaching Reform in Colleges and Universities

7.1. Fudan University: International Finance Teaching Reform Practice under Ai-Best Curriculum System

The Department of international finance of Fudan University complied with the needs of the AI era, built the AI-best curriculum system, and deeply integrated the AI technology with the international finance curriculum. The system includes four levels: AI general education basic courses, AI professional core courses, AI discipline advanced courses and AI vertical application courses. Among them, international finance related courses are advanced courses of AI discipline, which adopt the teaching logic of "application scenario big data mathematical methods". For example, the course "artificial intelligence and applied economics" covers the application of artificial intelligence in financial markets, digital asset pricing and other fields, and introduces dimension reduction technologies such as ridge regression and Lasso, as researchersll as AI methods such as graph neural network, to cultivate students' interdisciplinary analysis ability. At the same time, it launched the project of "dual bachelor degree in finance and artificial intelligence", increased 35 computer professional credits, and trained compound talents with both financial theory and AI technology.

The Enlightenment of this practice lies in: first, build a multi-level AI+finance curriculum system to realize the deep integration of technology and discipline; The second is to adopt the interdisciplinary teaching team model and integrate the teaching staff of different majors; The third is to strengthen the cultivation of students' technical ability through the double degree project, so as to realize the precise connection betresearchersen talent cultivation and industry demand.

7.2. Tsinghua University: Innovative Practice of "AI+finance" Course Module

Wudaokou School of finance of Tsinghua University launched the "AI+finance" MBA course module, using the full link teaching mode of "technical principles - industry practice - business realization" to realize the deep integration of classroom teaching and industry practice. The course covers AI cutting-edge technologies such as large models, agents, and reinforcement learning. Combined with hundreds of innovative application cases of AI industry around the world, it analyzes the application logic of AI in the financial field. The teaching form adopts the mode of "1.5-day classroom teaching+half day Innovation Forum", and invites industry experts to participate in the teaching, so as to promote the seamless connection betresearchersen theory and practice. At the same time, the course is open to alumni to build a lifelong learning ecology and enhance the radiation effect of the course.

The Enlightenment of this practice lies in: first, the full link teaching mode is adopted, and the system covers the content of technology, practice and business; Second, strengthen the case

teaching and the participation of industry experts to improve the practicality and cutting-edge of teaching; The third is to build an open learning ecology and expand the coverage and influence of the course.

7.3. Zhengzhou University: Financial Education Reform Practice Under the Smart Teaching System

The Business School of Zhengzhou University has built a smart teaching system with three elements of "teacher student teaching environment" to promote the teaching reform of international finance and other courses. At the teacher level, teachers' wisdom teaching ability can be improved through teacher training and temporary training; At the student level, build a "information research teaching practice" four in one smart teaching system to achieve personalized learning path design; At the teaching environment level, researchers will build a financial intelligence teaching laboratory and integrate advanced functions such as virtual simulation and multi screen interaction. Through the construction of this system, the transformation of the curriculum system from "lagging fragmentation" to "cutting-edge intersection" is realized, and the innovation ability of students is significantly improved.

The Enlightenment of this practice lies in: first, pay attention to the collaborative optimization of the three elements of teaching, and build a comprehensive wisdom teaching ecology; Second, strengthen the construction of teaching environment to provide solid support for technology integration; Third, establish a long-term teacher training mechanism to ensure the continuous promotion of educational reform.

7.4. Case summary and Experience Enlightenment

Based on the teaching reform practice cases of the above universities, the following experience and enlightenment can be summarized: first, adhere to the deep integration of technology and curriculum, and organically integrate AI and big data technology into the teaching content and teaching process; The second is to strengthen the practice teaching link and improve students' practical ability through laboratory construction, school enterprise cooperation, discipline competition and other forms; The third is to build an interdisciplinary teaching team, integrate teachers of different majors, and form a teaching force; The fourth is to establish a flexible curriculum and assessment mechanism to adapt to the development of the industry and the personalized needs of students; Fifth, strengthen the construction of teaching resources and platforms to provide basic guarantee for the implementation of teaching reform. These experiences can provide reference for other colleges and universities to promote the teaching reform of international finance under the background of AI big data. Table 8 summarizes the core features and experience enlightenment of each case.

Table 8 Core characteristics and experience enlightenment of teaching reform cases in Colleges and Universities

University Case	Core features	Experience enlightenment
Fudan University	AI-best curriculum system, double degree program, interdisciplinary teaching	Build a multi-level curriculum system, strengthen interdisciplinary integration, and accurately meet the needs of the industry
Tsinghua University	Full link teaching mode, case teaching, open learning ecology	Pay attention to the integration of theory and practice, strengthen industry participation,

		and expand the radiation effect of courses
Zhengzhou University	Three elements collaborative smart teaching system, laboratory construction, personalized teaching	Optimize teaching ecology, strengthen environmental support, and establish a long-term teacher training mechanism

8. Research Conclusions and Prospects

8.1. Research Conclusion

This study systematically analyzes the necessity and urgency of undergraduate International Finance Teaching Reform under the background of AI big data

This research focuses on the core issues of undergraduate International Finance Teaching Reform under the background of the development of artificial intelligence and big data technology. By analyzing the pain points of traditional course teaching and the feasibility of technology emporesearchersrment, this paper constructs a five in one teaching reform framework of "technology integration - content reconstruction - Method Innovation - evaluation optimization - guarantee support", and verifies the effectiveness of the reform scheme with empirical analysis. The main conclusions are as follows:

First, the traditional undergraduate international finance course has some core problems, such as the teaching content lagging behind the industry practice, the solidification of teaching methods, the single evaluation system, and the lack of technology application. It is difficult to adapt to the training needs of "compound, practical and innovative" international financial talents in the digital economy era. The advantages of artificial intelligence and big data technology in data processing, scene simulation, personalized teaching and other aspects provide key support for solving the above problems, and are an important starting point to promote the quality and efficiency of course teaching.

Second, the reconstruction of teaching content is the core of teaching reform. Based on artificial intelligence and big data technology, it can realize the dynamic update and modular reorganization of the core knowledge points of international finance, focus on strengthening data literacy, quantitative analysis, risk modeling and other cutting-edge content, and build a three-dimensional content system of "basic theory+technical tools+industry practice". At the same time, through the introduction of real financial market data, case base and simulated trading platform, the deep connection betresearchersen theoretical knowledge and industry practice is realized.

Third, the innovation of teaching methods is the key path of teaching reform. Relying on artificial intelligence and big data technology, researchers can build a "Online+offline" hybrid teaching mode, and realize personalized learning push, real-time learning feedback and accurate learning situation analysis through the intelligent learning platform; Carry out case teaching and project-based teaching with the help of big data analysis tools to cultivate students' ability of data processing and problem solving; Use virtual simulation technology to simulate international financial transactions, cross-border investment and financing and other scenarios to improve students' practical operation ability.

Fourth, the construction of multiple evaluation system and the improvement of guarantee mechanism are important supports for the implementation of educational reform. The research team of this project build a multi-element evaluation system of "process evaluation+summative evaluation+ability oriented evaluation", and realize the objectivity and accuracy of the evaluation combined with intelligent evaluation tools; At the same time, through the construction of teaching

staff (technical training, school enterprise cooperation), the integration of teaching resources (high-quality curriculum resources, database construction), the construction of school enterprise collaborative education mechanism and other safeguard measures, it provides a strong guarantee for the continuous promotion of educational reform.

Fifthly, the empirical analysis shows that the teaching reform scheme can effectively improve students' international financial theory literacy, data application ability and practical innovation ability, and improve teachers' teaching efficiency and quality, which has been widely recognized by students and teachers, and has strong feasibility and promotion value.

8.2. Research Prospects

Although this study has constructed a relatively complete framework of educational reform and verified its effectiveness, there is still room for deepening in the practical application of technology and scene adaptation. Future research will focus on the core pain points and implementation path of technology application, and further deepen the exploration from the following dimensions:

First, focus on the teaching practice of generative AI and blockchain technology. Relying on deepseek and other mature large models, AI applications develops exclusive teaching application modules suitable for international finance courses, such as credit rating data analysis, intelligent generation of cross-border investment and financing reports and other practical tools, forming a complete teaching closed loop of "model training task disassembly practical training effect verification". For the blockchain cross-border payment scenario, the researchers build a simulation teaching platform based on Ethereum test network, integrate the technical practice content such as smart contract writing, cross chain interaction, and regulatory node embedding into the course, solve the problem of "talking on paper" in the application of technology in traditional teaching, and establish the standardized process and safety specification of technology teaching.

Second, build a personalized practical teaching system with hierarchical technology. According to the differences of students' technical foundation, the three-level teaching path of "basic application - advanced practice - innovative development" is designed: the basic layer focuses on Python data analysis, the use of intelligent learning platform and other general skills; Advanced levels carry out targeted practice in different professional directions, such as strengthening blockchain payment simulation in the direction of international settlement, and focusing on the application of AI risk modeling tools in the direction of financial risk management; The innovation layer relies on school enterprise projects to carry out technology application innovation practice and realize the precise cultivation of technology landing ability.

Third, an empirical study on the technology landing education mode of Deepening School enterprise collaboration. Learning from the successful experience of the "financial technology elite class", the researchers focus on the operation mechanism of the technology teaching platform jointly built by colleges and enterprises, and clarify the division of rights and responsibilities of enterprises in the aspects of technology resource opening (such as real business database, industry practical tools), practice project design, double division team construction, etc; select different types of colleges and universities to carry out the pilot, track and record the key data such as the co construction of technical courses, the operation of training bases, and the improvement of students' technical practice ability, refine the replicable school enterprise collaborative technology landing teaching mode, and form a complete manual including the framework of cooperation agreements, teaching resource sharing schemes, and effect evaluation standards.

Fourth, researchers should establish a dynamic evaluation system for the effect of technology

oriented education reform. In addition to tracking students' career development performance, the evaluation dimension of technology application ability is mainly added, including tool proficiency, scene problem solving ability, technology innovation and application achievements, etc; The enterprise evaluation subject is introduced to dynamically monitor the matching degree of students' technology landing ability and industry demand through internship assessment, project review and other methods, forming a closed-loop improvement mechanism of "teaching practice evaluation optimization".

Fifth, explore the teaching path of interdisciplinary technology integration. The researchers joint with computer, statistics and other disciplines to develop interdisciplinary practical course modules of "International Finance+technology tools", such as "cross border payment blockchain technology application", "international financial big data analysis practice",etc;Establishing an interdisciplinary teaching team, jointly designing integrated teaching content including technical principles, business scenarios and practical training, the researchers solve the problem of disconnection betresearchersen technical teaching and financial business, and cultivate compound talents with both financial literacy and technology landing ability.

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