

Human-Shaped Robots Enhance the Practical Teaching of Financial Management: Innovative Approaches to Job Simulation and Collaborative Decision-Making

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Abstract: With the rapid development of artificial intelligence and robotics technology, humanoid robots have demonstrated great potential for application in various industries. Financial management, as the core function of enterprises, faces challenges such as the disconnection between theory and practice and the difficulty of traditional teaching methods in simulating complex business environments. This paper aims to explore how humanoid robots can empower the practical teaching of financial management. By constructing an innovative path of job simulation and collaborative decision-making based on humanoid robots, it enhances students' professional competence and innovative thinking. The paper believes that the introduction of humanoid robots not only provides students with immersive and highly interactive learning experiences, but also helps them understand the intelligent trend of future financial work, providing new ideas for cultivating high-quality financial talents who can adapt to the digital economy era.

Keywords: Humanoid Robot; Financial Management; Practical Teaching; Job Simulation; Collaborative Decision-Making

1. Introduction: the Urgency and Challenges of Talent Cultivation in Finance in the Era of Intelligence

The digital economy wave, with its irreversible momentum, is profoundly reshaping the global economic landscape and industrial ecosystem. Among them, the iterative evolution of cutting-edge technologies such as artificial intelligence, big data, cloud computing, and robotics has not only disrupted traditional production models and business logic, but also presented new challenges to the talent structure and skill requirements in various industries. Financial management, as the cornerstone of

enterprises' stable operation and value creation, is undergoing a transformation from simple accounting reporting to deep value creation, strategic support, and refined risk control. Intelligence and automation have become an irreversible development trend in the financial field. The emergence of new models such as intelligent financial shared service centers (FSSC), robotic process automation (RPA), and intelligent auditing has greatly enhanced the efficiency and accuracy of financial work, while also placing higher demands on the knowledge structure and ability profile of financial professionals.

However, when we examine the current practical teaching situation of financial management courses in universities, it is not difficult to discover that they are facing many deep-seated challenges. Although traditional teaching methods such as case analysis and sand table simulation have enhanced students' practical understanding to a certain extent, their limitations in simulating the complex and ever-changing real business environment and the high-pressure professional scenarios have become increasingly prominent. Employers generally report that there is a significant gap between students' theoretical knowledge and practical application, and they lack intuitive and in-depth understanding of the future intelligent and digital transformation of financial work. Moreover, the core competitiveness of future financial talents lies not only in the mastery of professional knowledge, but also in outstanding teamwork ability and the ability to make complex decisions across different fields. However, the existing teaching model still falls short in cultivating these advanced abilities.

In this context, the rise of humanoid robots has brought unprecedented opportunities to the practical teaching of financial management courses. Humanoid robots, with their human-like appearance, flexible movement capabilities, and

powerful perception and interaction functions, are expected to play a more immersive and interactive role in teaching. This article aims to deeply explore how humanoid robots can empower the practical teaching of financial management, by constructing an innovative path of job simulation and collaborative decision-making based on humanoid robots, thereby significantly enhancing students' professional competence and innovative thinking, and providing new ideas and practical paradigms for cultivating high-quality financial talents who truly meet the demands of the digital economy era.

2. Examination of the Era and Intelligent Requirements for Financial Management Practical Teaching

2.1 Limitations and Criticisms of Traditional Practical Teaching

For a long time, the practical teaching of university financial management courses has been regarded as a crucial link for the transformation of theoretical knowledge into practical operations. However, in the face of the ever-changing business environment and technological changes, the limitations of traditional practical teaching have become increasingly evident. On one hand, there is a structural disconnection between the teaching content and the actual needs of enterprises. Ju and Liu (2023) pointed out that the current practical teaching of financial management still lags behind in content update, teaching methods, and evaluation systems, making it difficult to meet the training needs of intelligent finance for skilled professionals [1]. The knowledge students acquire often focuses on accounting and reporting, and is insufficient in covering high-value activities such as financial analysis, risk management, and strategic decision-making. Moreover, they lack understanding of the application of emerging technologies in the field of finance.

On the other hand, the singularity of the practice teaching carriers and methods hinders students from obtaining a truly immersive experience. Most practical teaching still remains at the levels of case analysis, simulation software operation or simple enterprise visits. Although these methods have their own value, they are unable to truly reflect the complexity of cross-departmental collaboration within the

enterprise, the complexity of large amounts of data, and the uncertainty in the decision-making process. This "weak practice" teaching model leads to students exhibiting the phenomenon of "high expectations but low performance" when they enter the workplace, and their theoretical knowledge cannot be effectively transformed into the ability to solve practical problems. Moreover, traditional teaching models often neglect the cultivation of students' soft skills, such as communication and collaboration, critical thinking, and innovation ability, which are precisely the core competencies indispensable for future financial professionals.

2.2 Changes in Talent Demand in the Context of Intelligent Finance

With the extensive application of technologies such as big data, artificial intelligence, and blockchain in the financial field, financial management is accelerating its evolution towards intelligence, automation, and sharing. Intelligent finance is not merely a technological innovation at the tool level; it represents a profound transformation of financial functions, organizational structures, and even talent structures. In the future, financial professionals will no longer merely be "accountants", but data analysts, risk managers, and strategic decision-makers with the ability to integrate business and finance. Liu and Guo (2022) emphasize that in the era of intelligent finance, higher requirements have been set for financial personnel, demanding that they possess multiple capabilities such as data analysis, technology application, risk management, and value creation [2].

Specifically, the demand for financial talents in the era of intelligent finance exhibits the following notable characteristics: First, technical application ability. Capable of proficiently using intelligent technologies such as RPA, BI tools, and ERP systems for data collection, processing, analysis, and presentation [3]. Second, data analysis and decision support ability. Capable of discerning the essence of business from massive data and providing high-quality financial insights for business decisions. Third, risk management and control ability. Capable of using intelligent tools to identify, assess, warn, and manage various financial risks. Fourth, cross-functional collaboration ability. Capable of efficiently communicating and collaborating with business and technical departments to

promote the integration of business and finance [4]. Fifth, innovation and adaptability ability. Capable of actively learning new knowledge and skills and adapting to new challenges and opportunities brought by technological development.

The traditional teaching model is unable to effectively cultivate these comprehensive abilities. Therefore, it is urgent to introduce more forward-looking and interactive teaching tools and methods. Humanoid robots, as a new type of intelligent carrier, have unique advantages in simulating real scenarios and providing immersive interactive experiences. This provides a new breakthrough for solving the above teaching difficulties.

3. Innovative Pathways for Enhancing Financial Management Practical Teaching through Humanoid Robots

This paper proposes an innovative approach for enhancing financial management practical teaching by leveraging humanoid robots. The aim is to create a highly realistic, interactive, and futuristic learning environment for students through the construction of two core modules: job simulation and collaborative decision-making based on humanoid robots.

3.1 Job Simulation: Immersive Experience of Future Financial Work Scenarios

Job simulation is the core part of practical teaching. Sun and Wang (2024) pointed out that by incorporating humanoid robots, the authenticity, interactivity, and complexity of the simulation can be significantly enhanced, allowing students to personally experience the actual operation of future financial positions [5].

3.1.1 Simulation of the intelligent financial shared service center (FSSC)

Feng and Xia (2022) pointed out that the Financial Shared Service Center (FSSC) is an important future development direction for financial management. Its prominent feature is the standardization and high automation of business processes. Humanoid robots can simulate various roles in the FSSC, enabling students to deeply understand the operational logic of intelligent finance [6].

Interactive simulation of RPA robot approvers. Teachers can set humanoid robots as "RPA approvers", and based on the preset invoice review and reimbursement approval rules, automatically judge and make decisions on the

virtual vouchers submitted by students. Students need to understand the underlying logic of RPA and learn how to configure and optimize the approval rules of the robots, and even attempt to "teach" the robots to handle exceptional cases. This not only exercises students' rule-based thinking but also enables them to intuitively feel the efficiency improvement brought by automation.

Multimodal interaction of intelligent customer service robots. Human-shaped robots can act as "intelligent customer service" in the financial shared center, answering students' (simulating business department employees) common questions such as reimbursement procedures and cost standards in the form of voice or text. Through real-time interaction with the robots, students can experience the convenience of intelligent customer service and think about how to optimize the human-machine interaction interface and knowledge base to improve the accuracy and user satisfaction of intelligent services.

Demonstration of robot for data entry and processing. Human-shaped robots can demonstrate how to automatically identify and enter original voucher data through integrated technologies such as visual recognition (OCR) and speech recognition, and perform automatic classification and preliminary processing. Students can observe and analyze the efficiency and accuracy of the robot's data processing, and then critically think about the bottlenecks in the existing data processing flow and propose optimization plans based on the robot.

3.1.2 Construction of intelligent audit and risk management scenarios

Huang (2023) pointed out that intelligent auditing and risk management are areas in financial management that require high levels of analytical and judgmental skills [7]. Humanoid robots can serve as the embodiment of intelligent tools, assisting students in understanding and practicing these complex business operations.

Collaborative auditing with the auditing robot assistant. The humanoid robot can simulate advanced auditing software and, based on the preset auditing procedures, conduct in-depth analysis of simulated data to identify abnormal transaction patterns and detect potential risk points. Students can act as auditors and work together with the "auditing robot assistant" to complete auditing tasks, learning how to use technological means to improve auditing

efficiency and quality, as well as how to review and judge the analysis results of the robot.

Real-time monitoring by the risk warning robot. The humanoid robot can simulate the internal risk warning system of an enterprise. By conducting real-time monitoring and data analysis of key financial indicators (such as abnormal fluctuations in accounts receivable turnover rate, inventory overstock risks, and signals of tight capital chain), when the indicators deviate from the preset threshold, the robot automatically issues a risk warning and provides a preliminary analysis report. Students need to deeply analyze the causes of the risks based on the robot's warning information and propose forward-looking response strategies and control measures.

3.2 Collaborative Decision-Making: Cultivating Human-Machine Collaboration and Cross-Functional Communication Skills

In the future, financial work will place greater emphasis on cross-departmental and cross-functional collaboration, as well as deep collaboration between humans and intelligent systems. Humanoid robots, as collaborative partners, will effectively cultivate students' teamwork and complex decision-making abilities.

3.2.1 Cross-departmental collaboration and business-finance integration simulation

Peng and Zhang (2023) thought that in the operation of an enterprise, effective collaboration between the finance department and departments such as production, sales, procurement, and technology is of utmost importance [8].

Multioriented scenario negotiation and communication. Human-shaped robots can simulate representatives from other business departments (such as sales managers, production supervisors, technical directors, etc.) and engage in scenario dialogues and negotiations with students. [9]. For instance, a student could play the role of a financial manager and have an in-depth discussion with a human-shaped robot playing the role of a "sales manager" regarding the financial impact of a new product promotion budget and pricing strategy. Students need to learn how to clearly express financial viewpoints, understand and balance the needs and goals of other departments, and ultimately reach a mutually beneficial decision.

Collaborative optimization of supply chain

financial management. Teachers can set up human-shaped robots to simulate different links in the supply chain (such as key suppliers, logistics distributors, and end customers), and students play the role of enterprise financial managers, collaborating with these "robot roles" to jointly analyze the capital flow, logistics, and information flow in the supply chain, identify optimization points, and enhance the financial efficiency and risk-resistance capability of the entire supply chain.

3.2.2 Deep practice of human-machine collaborative decision-making

With the deep application of artificial intelligence in the field of finance, human-machine collaboration will become the mainstream working mode, rather than simply using tools.

Integration of intelligent decision-making assistance and human judgment. Human-shaped robots can simulate advanced intelligent decision-making systems to provide students with complex data analysis results, multi-dimensional prediction model outputs, risk scenario simulations, etc., as decision assistance. For example, in the simulation of enterprise merger and acquisition valuation, human-shaped robots can quickly process a large amount of historical data, provide results of multiple valuation models, and analyze sensitivity. Based on this, students, combined with market trends, industry experience and strategic intentions, make the final merger and acquisition decision, which highlights the importance of human critical thinking and strategic judgment in the intelligent era.

Complementary human-machine interaction and continuous optimization. Teachers set some highly uncertain and challenging financial decision-making problems. Some information is provided by human-shaped robots through automated analysis, while other key information needs to be obtained by students through manual analysis, experience judgment or external research. Students need to learn how to effectively integrate the computational advantages of robots and human intuition judgment, ethical considerations, and even question or correct the analysis results of robots, so as to achieve deeper collaboration and learning between humans and machines, and jointly explore the optimal solution.

4. Construction of Evaluation System for

Teaching Effect and Critical Reflection

4.1 Comprehensive Construction of Evaluation System for Teaching Effect

To comprehensively and objectively evaluate the effect of humanoid robots on the practical teaching of financial management, multi-dimensional and multi-level assessment methods should be adopted.

Quantitative indicator assessment. Quantitative evaluation can be conducted based on students' performance in intelligent financial operation skills tests, the completion degree of data analysis tasks, and the accuracy of simulated decision-making, etc. At the same time, questionnaires can be designed to collect students' perception data such as satisfaction with the teaching mode, the degree of improvement in learning interest, and the understanding of the trend of intelligent financial work in the future.

Qualitative analysis assessment. Teachers can observe and record students' participation, interaction, teamwork ability, critical thinking, and innovation ability during the teaching process. The ability of students to solve complex problems, cross-functional communication, and human-machine collaborative decision-making can be evaluated through group project reports, case analysis reports, and oral presentations submitted by students.

Long-term tracking and feedback. Track the employment destinations of graduates and their performance in the early stage of career development. Collect feedback from employers on their career competence and ability to adapt to the intelligent financial environment, and form a closed-loop mechanism for improving teaching quality.

4.2 Expected Benefits and Critical Thinking

Introducing humanoid robots to enhance the practical teaching of financial management is expected to bring significant educational benefits:

Significantly enhance practical skills and professional qualities. The immersive and highly interactive job simulation enables students to more realistically experience the financial work process, master the use of intelligent tools, and improve their ability to solve practical problems. This helps shorten the adaptation period for students from the campus to the workplace and enhances their employment competitiveness.

Deeply cultivate innovative thinking and collaborative spirit. The collaborative decision-making module will effectively cultivate students' teamwork, cross-departmental communication, and human-machine collaboration skills, stimulating their potential to explore innovative solutions in the future financial field, and making them future financial leaders who can lead change.

Prospectively cultivate comprehensive financial talents. The teaching content is closely integrated with the development trends of intelligent finance, helping students understand and adapt to the intelligent and automated changes in future financial work, and cultivating comprehensive financial talents with technical literacy, business insight, and innovation ability, making them more competitive in the intelligent era.

Significantly improve teaching quality and appeal. The innovative teaching model will greatly stimulate students' learning interest and participation, making the practical teaching of financial management more attractive, which is conducive to enhancing professional reputation and attracting more outstanding students.

Promote interdisciplinary integration and deep integration of industry-university-research cooperation. The application of humanoid robots will accelerate the deep cross-collaboration between finance management and disciplines such as artificial intelligence, robotics engineering, and data science, opening up new paths for future industry-university-research cooperation and jointly exploring the frontiers of intelligent finance.

However, we must also conduct critical thinking. The introduction of humanoid robots is not a panacea. We cannot blindly pursue the novelty of technology while neglecting the essence of education. Over-reliance on robot simulations may lead to the weakening of students' abilities in real interpersonal communication and complex situation judgment. Therefore, in teaching design, we should always emphasize the dominant position of human-machine collaboration, ensuring that students truly understand the essence of "intelligence +" finance, rather than merely remaining at the tool level. At the same time, we must be vigilant about ethical issues related to technology, guiding students to think about the impact and opportunities of artificial intelligence on the financial profession, and cultivating their

sensitivity and critical thinking on issues such as data security and algorithm bias.

5. Challenges and Future Prospects

Although humanoid robots have great potential in enhancing financial management practice teaching, they still encounter some significant challenges during the actual implementation process.

5.1 Challenges and Countermeasures

Firstly, the high technical costs and equipment investment are real barriers. The purchase, maintenance, and development of the accompanying software systems for humanoid robots are not insignificant expenses, posing challenges to the hardware facilities and financial resources of most universities. Therefore, it is necessary to explore the model of school-enterprise cooperation, introduce enterprise resources; strive for government or foundation project funding; initially, start with small-scale pilot projects, gradually expand, and consider renting or sharing robot resources.

Secondly, the iterative upgrading of teachers' capabilities is crucial. Teachers need to master the operation of humanoid robots, programming, cutting-edge knowledge in intelligent finance, and interdisciplinary teaching methods, which poses higher requirements for the existing teaching staff. Schools should increase investment in teacher training, encourage teachers to participate in related research projects, introduce industry experts for guidance, and establish a teaching team composed of teachers with backgrounds in finance, computer science, robotics, etc.

Furthermore, the reconfiguration of teaching content and curriculum system is inevitable. The existing curriculum system may need to undergo significant adjustments to incorporate the teaching of humanoid robots, designing more targeted, practical, and forward-looking teaching content. This requires in-depth research on the development trends of intelligent finance, conducting sufficient research with enterprises, and constructing modular and project-based curriculum systems.

Additionally, data security and privacy protection are must-considered red lines. When simulating real business scenarios, it is necessary to attach great importance to the security and privacy protection of teaching data, ensuring the compliant use of teaching data and avoiding the

leakage of sensitive information. Data can be simulated using anonymized data, virtual data, etc.

Finally, the guidance of technical ethics and social impact is indispensable. With the popularization of artificial intelligence and robot technology, the impact on the employment structure, social organizational ethics, etc. is increasingly prominent. In teaching, students should be guided to correctly understand these potential impacts, cultivate their critical thinking and ethical awareness, and enable them to responsibly apply intelligent technologies in the future.

5.2 Outlook on the Future Prospects of Intelligent Financial Education

Despite numerous challenges, the application of humanoid robots in financial management practice teaching remains an important direction for future educational development. Further exploration and practice can be carried out in the following aspects:

Build an immersive teaching environment that integrates virtual and real elements. Deeply integrate humanoid robots with virtual reality (VR) and augmented reality (AR) technologies to create a more immersive and multimodal practical teaching experience. Students can interact with humanoid robots in a virtual environment, while combining real robot operations to achieve seamless connection between theory and practice.

Develop customized and intelligent teaching platforms. Based on the needs of financial management practice teaching, develop a comprehensive teaching platform that integrates functions such as humanoid robot control interfaces, intelligent financial data simulators, case analysis tools, and intelligent assessment systems, to achieve the sharing of teaching resources and personalized learning.

Deepen industry-academia integration and the introduction of real projects. Strengthen cooperation with intelligent finance enterprises and robot research and development institutions to jointly develop teaching cases that are closer to the actual situation of enterprises, and even introduce real de-identified projects from enterprises, allowing students to enhance their abilities through real and practical experiences, achieving "learning by doing and doing by learning".

Explore personalized and adaptive learning paths.

Utilize the intelligent interaction capabilities and data analysis abilities of humanoid robots to provide personalized learning content, task recommendations, and feedback mechanisms based on students' learning progress, ability characteristics, and career interests, to achieve differentiated teaching.

Expand application scenarios and integration with the forefront. In addition to financial sharing centers and intelligent auditing, humanoid robots can be applied to more cutting-edge fields such as intelligent investment advice, financial data visualization, blockchain finance, and sustainable development finance in the future, allowing students to be exposed to and understand the latest financial technologies. For example, a humanoid robot simulating as an intelligent investment advisor can recommend investment portfolios based on market data and students' risk preferences; or a humanoid robot simulating to participate in carbon emission data accounting and reporting, understanding the practice of sustainable development finance.

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