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Research on the Training of Financial Professionals in the Era of Artificial Intelligence

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Abstract: *As artificial intelligence (AI) technology becomes increasingly integrated into the financial industry, there is a notable rise in the market demand for professionals who possess both financial expertise and technical skills. This article explores the significance of developing financial professionals in the context of the AI era, the challenges encountered, and strategies for nurturing interdisciplinary talent in finance, particularly in the realms of financial big data and machine learning. It examines the current obstacles in financial education, such as outdated teaching materials and insufficient practical training, and proposes solutions including the modernization of course content, enhancement of practical instruction, and promotion of collaboration between educational institutions and enterprises. The goal is to prepare financial professionals who can effectively address the challenges of the artificial intelligence era. The research indicates that the establishment and maintenance of financial technology laboratories, along with the implementation of innovative teaching methodologies, are essential for cultivating interdisciplinary talents capable of adapting to the evolving needs of the financial sector.*

Keywords: *Artificial Intelligence, Financial Education, Financial Technology, Innovative Teaching*

1. Introduction

The technological revolution driven by artificial intelligence (AI) has not only profoundly transformed our daily lives but has also significantly impacted various sectors, particularly the financial industry. With the rapid advancement of AI technologies, including big data, machine learning, and natural language processing, the financial sector is experiencing an unprecedented wave of change. Applications of artificial intelligence, ranging from intelligent investment advisors to risk management, fraud prevention, and customer service, are redefining the landscape of financial services. This transformation not only enhances operational efficiency but also effectively reduces operating costs, thereby creating expansive opportunities for innovation within the financial sector. As AI technology becomes increasingly integrated into finance, the demand for financial professionals has undergone a fundamental shift. The traditional models of financial education are no longer sufficient to meet the current market demands for skilled professionals. Consequently, there is an urgent need for a new generation of talent that possesses expertise in both financial knowledge and technical skills. In this context, it is crucial to investigate the training of financial professionals in the era of AI. This study aims to explore the core competencies required by financial professionals in the age of artificial intelligence, assess the challenges facing contemporary financial education, and investigate innovative educational models and teaching strategies. Furthermore, this paper will discuss approaches to cultivating financial professionals capable of meeting the evolving demands of the industry through collaborations between educational institutions and enterprises, as well as interdisciplinary education.

2. Literature Review

In the field of education, Chen et al. (2020) in the analysis of the computer development of artificial intelligence has a significant impact on the education sector or had a significant impact, especially in the application of education institutions of AI provides students with a better learning experience, AI can according to the needs of students and ability and personalized learning materials[1]. Goralski and Tan (2020) believes that education must train students to work together on teams using artificial intelligence and new tools available to various industries[2]. Vinuesa et al. (2020) noted that the technological advantages provided by AI may have a positive impact on the achievement of many sustainable

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development goals within the economic group[3]. In the field of financial, Milana and Ashta (2021) found that AI technology in the financial sector has made significant progress, especially in improving efficiency, risk management, forecasting and decision support. Despite the challenges, the development of AI technology has brought new opportunities to the financial industry and is expected to play a key role in financial innovation and growth in the future[4]. Kumariet al. (2021) Using the system dynamics model research shows that all financial institutions or companies involved in financial tasks must adopt artificial intelligence in order to become competitive in the global competition[5]. With the rapid development of artificial intelligence, artificial intelligence has been widely popularized in the financial field. On the one hand, the future AI economy has set new requirements for young people who graduate from different degrees. On the other hand, artificial intelligence has become a core element of the education system and a basic tool to gain a competitive advantage in the education service market[6]. AI is being used by companies to improve the recruitment process, identify individual training and develop skills and needs and retain talent[7]. To achieve the perfect integration of fin-tech development and education, the key is to make full use of the reform potential of fin-tech. This requires us to update the educational curriculum to achieve a balance between financial knowledge and technical understanding[8]. Facing the scarcity of corresponding talents, the wide application of big data technology provides a new path for the training of financial professionals in colleges and universities[9]. Therefore, on the basis of the research of scholars in the field of finance and education, this paper conducts a research on the training of financial professionals in the AI era.

With the continuous progress of fin-tech, the traditional financial industry is undergoing a profound change, which not only puts forward higher requirements for financial practitioners, but also poses new challenges to financial education. The extensive penetration of AI technology in the field of financial services, involving credit assessment, risk management, fraud detection, intelligent investment advisory and other aspects. It is urgent to conduct research and development in teacher training and educational technology concepts to bridge the gap between AI and education [10]. Therefore, we need to deeply study how to cultivate compound talents who understand both finance and technology in the AI era, so as to meet the needs of the future financial industry. Therefore, it is particularly important to discuss how to cultivate the financial compound talents with interdisciplinary knowledge and skills in the era of AI. In the era of AI, cultivating financial compound talents is a systematic project, which requires the joint efforts of education, enterprises and the government. Only by reforming educational innovation, strengthening practical teaching, promoting school-enterprise cooperation and policy support, can we cultivate compound talents who can adapt to the future development of fin-tech and provide strong talent support for the continuous innovation and development of the financial industry.

3. Talent Demand of The Financial Industry in the AI Era

The application of AI technology in the financial sector demonstrates a broad and profound trend, encompassing various aspects such as risk management, investment analysis, and customer service. As advancements in big data and machine learning technologies continue, financial institutions are increasingly capable of processing vast amounts of data more efficiently, leading to more accurate decision-making. Consequently, these institutions require not only professionals with financial knowledge and skills but also those who can comprehend and apply AI technology. This necessitates that financial practitioners possess interdisciplinary knowledge and skills, including data analysis, machine learning, natural language processing, and other AI-related technologies. The integration of AI technology with financial operations demands that team members grasp both the technological and business dimensions. Understanding customer needs and addressing the challenges of business development are essential. Adjusting the division of labor according to business insights is crucial to maximizing the potential of interdisciplinary talent. Furthermore, the implementation of AI technology has brought data security and compliance to the forefront of concerns. Financial institutions must employ professionals to ensure the compliance and security of AI models, particularly regarding data privacy protection, algorithmic fairness, and transparency. Thus, there is a pressing need for talent that understands the logic and requirements of the financial industry and can effectively integrate AI technology with financial operations to enhance service efficiency and quality. This entails that team members not only comprehend the technology but also the business context, enabling them to provide tailored solutions to meet customer needs.

With the increasing application of artificial intelligence technology in the financial industry, higher education institutions urgently need to update their financial textbooks and curriculum systems. Currently, many financial textbooks are outdated and do not cover the latest developments in the financial market, which not only diminishes students' enthusiasm for learning but also restricts their ability to apply theory

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to practice. To enhance the practicality and appeal of these textbooks, it is essential to incorporate more real-world cases and in-depth analyses of current market trends. The demand for financial talent has evolved; therefore, to align with the needs of the contemporary industry, financial education should integrate financial technology, data analysis, artificial intelligence, and emerging technologies such as blockchain. This integration necessitates the cultivation of interdisciplinary knowledge and skills, incorporating science and technology into the curriculum and strengthening the connections between finance and other disciplines, such as computer science and statistics. Furthermore, students' limited opportunities for practical experience in financial institutions hinder their comprehensive understanding of the financial market and the development of practical skills. To address this, financial education in universities should include case studies, simulated trading, and financial laboratories to enhance students' ability to apply theoretical knowledge.

In terms of educational models and curricula, British and American universities lead the way, offering a spectrum that ranges from basic concepts to complex financial products and markets. This approach transitions financial education from foundational enlightenment to a compulsory university course, characterized by international features that attract global students and provide a multicultural learning experience. The advantage of this model lies in its ability to systematically cultivate students' financial knowledge. In recent years, Chinese universities have begun to prioritize financial education, gradually incorporating it into the national education system. They offer international cooperation projects and student exchange programs, aligning with the realities of China's financial market to enhance students' global perspectives and cultivate financial talent that meets local market needs. Concurrently, Chinese universities emphasize localization to address the demand for financial professionals within the Chinese market. However, a limitation of this approach may be the need for improved internationalization and a lack of practical teaching opportunities.

In terms of the integration of theory and practice, overseas universities typically maintain robust practical teaching connections that enable students to apply theoretical knowledge to real-world problems. Chinese universities are also enhancing their practical teaching methodologies, exemplified by the new engineering construction "electricity scheme" launched by TC. This initiative aims to cultivate financial and technological elites with cross-border innovation capabilities through a project-based curriculum system and cross-border integration. While these efforts are designed to foster students' innovation abilities and practical skills, there is a need for additional resources and support from faculty.

4. Training Strategy of Financial Compound Talents in the AI Era

AI technology can reduce barriers to the dissemination of financial knowledge, enhance the efficiency of this dissemination, and improve investors' understanding and participation in the market, thereby enabling broader participation in the financial market. The "Investment and Education Pioneer" conference held by the China Zhengzhou Commodity Exchange in October 2024 demonstrated how AI can facilitate a new model of financial education. Through natural language processing (NLP), intelligent assistants can swiftly address investors' inquiries and offer personalized investment advice. Additionally, machine learning models are being utilized to analyze market data, aiding users in better comprehending market dynamics.

Furthermore, AI technology can strengthen the synergy between scientific and technological education and humanistic education, emphasizing the cultivation of students' innovative abilities and enhancing the quality of talent development. At the Shanghai Foreign Economic and Trade University, the School of Finance has initiated the "Artificial Intelligence + Financial Education" project, which involves the development of a natural language semantic analysis software system for assessing the underlying logic of course ideologies. This system employs "artificial intelligence +" methodologies to mine subject data from text generated during the course, analyze emotional characteristics, and evaluate values. It enables timely, continuous, and comprehensive tracking of the effectiveness of ideological education in courses, providing valuable feedback for educators to optimize teaching strategies and content.

AI technology can enhance teaching strategies and improve educational outcomes. A research team from Columbia University and Invertible AI has proposed a set of advanced Multimodal Large Models (LLMs) called FinTral. Utilizing a big data monitoring center and an intelligent teaching platform, teachers can collect multimodal big data generated throughout the financial teaching process in real time. By integrating this data with course-specific evaluation metrics, educators can monitor and assess students' learning in real time. This approach facilitates the quantitative measurement of various

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dimensions, including external and explicit financial basic theory, financial operational skill levels, and internalized implicit values such as innovation consciousness, critical thinking ability, and psychological motivation. Consequently, an efficient, dynamic, and comprehensive student profile is generated, enabling teachers to better understand the diverse needs of their students.

In the era of AI, the collaborative model between universities and enterprises is crucial for the training of financial professionals. This partnership fosters a deep integration of education and industry, thereby cultivating financial talents that are more aligned with market demands. By combining the latest developments in the financial sector, introducing cutting-edge technologies, and continuously updating and optimizing course content through interdisciplinary education, it is essential to incorporate emerging technologies such as financial technology, data analysis, artificial intelligence, and blockchain into traditional financial education. Furthermore, increasing practical teaching opportunities enhances students' case analysis skills by introducing simulated trading and financial laboratories, which aid in the application of theoretical knowledge. To facilitate this integration of industry and education, universities and enterprises should collaborate to provide students with internship and employment opportunities, thereby enabling them to better understand industry dynamics and work requirements.

In light of the current state of school-enterprise cooperation, it is essential to establish a team of financial talents suited for the new era. Universities and enterprises should enhance vocational skills training by offering professional development in cutting-edge areas such as fintech, financial analysis, laws and regulations, and risk management. This collaboration should also promote the cross-sectional application of artificial intelligence within the finance sector, thereby improving students' professional skills. Additionally, it is crucial to strengthen the training and ongoing development of existing educators. Establishing a cooperation mechanism between teachers and enterprises will encourage faculty participation in industry communication and practical activities, enhancing their ability to understand and apply emerging technologies. Furthermore, promoting educators' awareness of industry dynamics and practical needs will facilitate the optimization of curriculum design and teaching content. By utilizing projects as a vehicle for collaboration, we can strengthen partnerships and achieve mutually beneficial outcomes, ultimately training high-quality applied talents to meet the demands of regional economic and social development.

The construction and operation of the fintech laboratory is a crucial component of financial education. By providing a practical teaching platform, students can learn and apply theoretical knowledge within a simulated real-world financial environment. Fintech laboratories are typically modeled after actual securities trading floors and are equipped with circular horse racing screens, interactive display screens, and multiple student experimental terminals. These facilities not only offer an intuitive and real-time display platform for financial commodity market data and information, but also enable students to engage in financial big data processing and analysis, quantitative investment practices, and other operations. The laboratory must integrate advanced financial data platforms, financial information analysis and simulation trading platforms, and quantitative investment model development and research platforms, utilizing the latest fintech technologies such as big data analysis, artificial intelligence, blockchain, and cloud computing to simulate financial market operations. The application of these technologies can enhance students' practical skills and facilitate a deeper understanding of the complexities of financial markets. The fintech laboratory supports the experimental and practical teaching modules for various fintech and big data courses, addresses the research needs of undergraduate and graduate students in these fields, and provides a vital support platform for collaboration between academic institutions and financial organizations, fostering in-depth partnerships and jointly exploring the transformation of fintech innovations.

Fin-tech practice teaching plays a vital role in cultivating financial professionals. Practical teaching enables students to confront real-world problems and deepen their understanding of theoretical knowledge by actively solving these issues. This learning approach facilitates a transition from mere "understanding" to "understanding and mastering," thereby enhancing both the efficiency and quality of learning. Through practical teaching, students can develop their practical abilities, apply theoretical knowledge to solve real-world problems, improve their professional skills, and become more competitive in areas such as financial product design, innovation, and quantitative investment in the future. The establishment of a practical teaching system is instrumental in achieving a deep integration of education and industry, aligning educational content more closely with real-world applications, and enhancing the practicality and relevance of education. Practical teaching encourages innovative methods such as the CDIO model (Conceive, Design, Implement, Operate), which centers on engineering projects, and PBL (Problem-Based Learning), which focuses on complex, meaningful problems that require independent inquiry and collaboration for resolution. These methods enhance students' financial technology business

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practice abilities and teamwork skills, preparing them to meet the demands of the financial industry. Furthermore, the construction and operation of fin-tech laboratories provide a crucial practical platform for financial education, emphasizing the essential role of practical teaching. It not only enhances students' operational capabilities but also fosters the integration of education and industry, laying a solid foundation for their future development.

5. Financial Big Data and Machine Learning Talent Training

The training of talent in financial big data and machine learning represents a critical avenue for the advancement of the contemporary financial industry. While this field faces numerous challenges, it is imperative to explore effective teaching methodologies. The cultivation of professionals skilled in financial big data and machine learning encounters various obstacles; however, there exist viable pedagogical strategies. By meticulously designing the curriculum, enhancing practical instruction, fostering an international perspective, emphasizing continuous learning, and implementing innovative teaching methods, it is possible to develop well-rounded individuals with a robust financial foundation, proficiency in big data processing, and expertise in machine learning. This approach will provide substantial talent support for the growth of the financial sector.

A significant challenge lies in integrating big data and machine learning courses into existing finance curricula to facilitate interdisciplinary learning. It is essential to ensure that students acquire competencies in big data processing and machine learning. Additionally, establishing a coherent training model that promotes the synergy between academia and industry is another critical issue. Developing a training system that addresses both academic requirements and market demands, as well as creating an effective operational mechanism to ensure the successful implementation of financial big data professionals, presents a major challenge in talent development. This encompasses various aspects, including curriculum design, allocation of teaching resources, and opportunities for student practice.

In terms of curriculum design, it should encompass a mathematical foundation, financial theory, big data technology, and machine learning. Foundational courses must include calculus, linear algebra, probability theory, and mathematical statistics, alongside essential financial courses such as macroeconomics, microeconomics, and finance. Core courses should cover financial mathematics, financial engineering, econometrics, financial risk management, and should also introduce Python programming, big data visualization technology, data collection techniques, and statistical machine learning, among other fintech-related subjects.

Practical teaching is a crucial approach to enhancing students' ability to apply big data and financial knowledge. Establishing a financial mathematics laboratory, equipped with advanced computing resources and a financial data platform, will enable students to gain hands-on experience with financial mathematics software and data analysis tools. Additionally, case studies, simulated trading, and practical training are vital components of this experiential learning. Given the global evolution of the financial industry, it is particularly important to foster students' international perspectives and cross-cultural communication skills. This can be achieved through foreign language training, international cultural exchange activities, and overseas study tours. As fintech is a rapidly growing field with continually emerging analytical tools and technologies, it is essential to cultivate students' ability for lifelong learning and encourage them to enhance their professional skills through self-study, participation in online courses, or professional training.

6. Conclusions

With the popularization of AI technology, financial institutions face an urgent demand for professionals possessing both financial acumen and technical expertise. The AI era necessitates that financial practitioners not only master financial principles but also acquire skills in AI-related technologies, including big data processing, machine learning, and natural language processing. Practical teaching methods, such as fin-tech laboratories and partnerships with industry, can enhance students' operational capabilities and problem-solving skills. Furthermore, students should be encouraged to continually update their knowledge through self-directed learning, online courses, and professional training to adapt to the rapidly evolving financial landscape. By fostering an international perspective through cultural exchanges and study tours abroad, we aim to broaden students' global outlook and cultivate competitive financial professionals.

To improve the preparation of financial professionals for the demands of the AI era, several strategies

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are recommended. First, universities should strengthen collaborations with fin-tech enterprises to co-develop courses, ensuring that the curriculum remains aligned with industry needs. Second, students should be motivated to engage in practical projects and competitions to enhance their hands-on skills and innovative thinking. Additionally, institutions must provide regular training for educators to keep their professional knowledge current, thereby maintaining the quality and effectiveness of instruction. Finally, it is advisable for government and educational authorities to establish relevant policies that support the advancement of fin-tech education, fostering a conducive environment for the training of financial professionals.

As AI technology progresses, the financial sector is set to rely more on data analysis and algorithm-based models to improve decision-making processes. Therefore, training for finance professionals must prioritize enhancing skills in data processing and analysis. In addition, with the rise of emerging technologies like blockchain and cryptocurrencies, it is essential for financial education to be regularly updated to reflect the changes these innovations introduce. Moreover, the financial sector is facing increasing requirements for compliance and risk management, which calls for more emphasis on pertinent knowledge and skills within the training of financial experts. In response to these evolving challenges, financial professionals face unique opportunities, such as starting ventures in the fintech arena and competing globally in financial markets. Educational institutions should proactively revise their teaching strategies to provide students with a well-rounded and forward-thinking education, thus nurturing adaptable talents equipped to address the future demands of the financial industry.

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