Research on the Development of Intelligent Financial Education in the Era of Artificial Intelligence

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Abstract
With the continuous progress of the digital era, artificial intelligence is increasingly interwoven with various fields. This paper focuses on the current status of financial management courses, applies the SWOT analysis method to analyze the current situation of the development of financial education, proposes the problems existing in current courses, discusses the limitations of traditional teaching, explores the application of AI technology in financial management education, improves and refines course design, breaks the limitations of traditional teaching methods, emphasizes the integration of theory and practice, enhances students' professional competence, cultivates financial management thinking, and builds an intelligent teaching platform. On this basis, it discusses the specific applications of AI in three parts: designing basic courses, cultivating professional competence and thinking, and building a teaching platform. The aim is to innovate financial management education, promote its sustainable and innovative development, and cultivate high-quality talents who can meet the needs of the future financial industry.

1. Introduce

With the rapid advancement of AI technology and the fluctuating data deluge in the digital era, the ability to use AI to accurately and rapidly process relevant information and make reasonable predictions for the future is a fundamental competence for financial professionals. Research institution Gartner categorizes artificial intelligence (AI) into four major types: Data-centric AI, Model-centric AI, Application-centric AI, and Human-centric AI. It emphasizes the importance of data, models, applications, and human-centeredness. With the rapid advancement of AI technology and the fluctuating data deluge in the digital era, the ability to use AI to accurately and rapidly process relevant information and make reasonable predictions for the future is a fundamental competence for financial professionals. According to data from the "Sunshine College Entrance Examination" platform, the number of applicants for accounting and finance majors in China has been increasing year by year, consistently ranking among the top five. However, there is an increasing shortage of

intelligent financial talents with the ability to efficiently apply AI and make intelligent decisions. Therefore, it is crucial to promote AI in financial education, accelerate the pace of curriculum development for financial management majors to keep up with the times, cultivate high-quality financial talents to cope with the digital era, optimize the "teaching-learning" model, and expedite the establishment of intelligent teaching platforms. This will enable technology to empower education, create a better and smarter learning environment, enhance the competitiveness and relevance of graduates in financial management majors, and promote the sustainable development of financial management education.

1.1 Literature Riview

There is a time lag in the course content and the course structure is unreasonable.

The updating speed of course content lags behind industry development. With the continuous advancement of AI technology and rapid changes in market demands, financial content and tools are constantly being updated. However, due to the lag in course content and structure [Adunlin, G., & Pan, K. (2022)]**Error! Reference source not found.**, their functions have not been fully utilized. The curriculum system of financial management in most universities has been in use for several years, and its content and structure are no longer suitable for the requirements of financial management in the new situation, facing issues of obsolescence and outdatedness **Error! Reference source not found.**. For example, (regulations on electronic accounting vouchers have been added, stipulating that "entities should ensure that any tampering with electronic accounting vouchers can be detected and prevent the duplicate entry of electronic accounting vouchers.") However, universities have not incorporated corresponding content into their curriculum systems, resulting in a disconnect between university teaching and social application, which poses certain difficulties for graduates of financial management majors in employment and career choices **Error! Reference source not found.**. The course structure is unreasonable, with specialized courses such as enterprise financial management, macro financial management, and international financial management, which have different application scopes **Error! Reference source not found.**being included in a unified curriculum system. There are many required courses and few elective courses, and the overall course content presents a phenomenon of "too much and messy," making it easy for students to fall into a dilemma of not knowing what to learn during the learning process. Currently, universities are caught in a deadlock of blind obedience and roughness when designing financial management courses, failing to arrange courses according to their own professional construction requirements and talent training objectives. This results in the inability to carry out professional teaching tasks in accordance with the gradual teaching rules of learning financial management software systems, mastering application skills, and the content learned by students often fails to keep pace with the development of the times and fully realize its potential.

The monotony of traditional teaching mode

Traditional teaching methods are monotonous and lack the integration of theory and practice. Often, traditional teaching adopts a one-way, teacher-centered approach, where teachers dominate the classroom absolutely and students passively receive knowledge. This approach ignores the student-centered status and hinders the development of students' initiative and creativity, especially in handling financial issues and applying learned knowledge in real-world situations**Error! Reference source not found.**, which is crucial for enhancing their professional qualities and operational skills. Single teaching methods such as lectures and discussions lack diversity and flexibility. This teaching style can easily lead to student burnout, causing them to lose concentration in class or even skip classes, ultimately affecting their learning outcomes.

With the proliferation of AI technology, traditional teaching modes have neglected the integration with intelligent technology. Intelligent financial management tools, such as advanced functions of Excel, and data analysis software like Python and R, are becoming increasingly important in financial management **Error! Reference source not found.**. However, traditional teaching methods lack instruction and training on these tools and are deficient in the establishment of intelligent educational platforms. This makes it difficult to adapt

to the new era's "teaching-learning" model and the continuously evolving intelligent learning environment, posing a challenge to educators' ability to adapt their teaching strategies**Error! Reference source not found.**.

The scarcity of educational talents in financial management

As enterprises deepen their digital transformation, AI technology is gradually influencing the financial education industry [Luan, H., et al. (2020)]. This requires financial educators to not only possess traditional financial skills but also master new skills such as data analysis and big data processing. This has led to a more diversified and high-end demand for financial education talents in universities. However, some regions and institutions have relatively short histories of establishing financial management majors, resulting in a limited intake of high-quality teaching talents in this field. Consequently, the issue of talent scarcity is prominent.

The traditional teaching mode also exhibits obvious limitations in the curriculum of financial management programs. The teaching method, which primarily focuses on lectures and demonstrations, neglects the cultivation of students' financial thinking and lacks interactivity and participation. In financial learning, students need to constantly practice, identify their weaknesses, and promptly communicate with teachers to solve problems. Traditional teaching methods in the past overlooked this point, leading to a lack of necessary interaction and support for students during the learning process. Furthermore, each student has a different learning style and requires personalized learning guidance and support. However, the single traditional teaching method is unable to meet the personalized needs of students. The digital era poses challenges to both teachers and students, requiring them to not only possess solid traditional financial knowledge and fundamentals but also master AI-enabled financial tools.

In summary, there are issues in the current undergraduate-level financial management curriculum in terms of course content, "teaching-learning" mode, and teaching platforms**Error! Reference source not found.Error! Reference source not found.**. To address these issues, it is necessary to actively explore innovative teaching methods and technologies, among which the application of AI technology provides a new direction for curriculum teaching for both teachers and students.**Error! Reference source not found.**

2. Research Methods

The introduction of SWOT analysis to the education of financial management majors aims to analyze the current teaching environment and educational needs. By utilizing the basic principles of SWOT analysis, a comprehensive and systematic analysis of the internal and external environments of financial management majors is conducted from four aspects: strengths, weaknesses, opportunities, and threats. The goal is to improve the education of financial management majors, thereby enhancing fundamental financial thinking and skills, promoting sustainable development in the field of financial management, and cultivating high-quality talents suitable for the intelligent financial industry.

2.1 From the perspective of Strength (优势) analysis

2.1.1 Theoretically, the system is comprehensive and the teaching staff is highly qualified

The education of financial management majors boasts a comprehensive theoretical system that encompasses multiple disciplinary fields such as finance, accounting, and economics, with a long-standing history of establishment. The major possesses a team of experienced teachers with excellent teaching and research capabilities, which provides students with a solid theoretical foundation and helps them comprehensively understand the core concepts, principles, and methods of financial management.

2.1.2 Wide market demand

With the development of the market economy and intensifying competition among enterprises, there is a strong demand for financial management talents. Both large enterprises, financial institutions, and startups

require professional financial management talents to support financial decision-making and operations, providing broad employment prospects for students majoring in financial management.

2.1.3 With the development of AI,Innovative Technology Convergence

The education of financial management majors is continuously integrating new artificial intelligence technologies, such as Convolutional Neural Networks (CNN), image generation, and Natural Language Processing (NLP). The application of these technologies provides students with more diversified learning and development opportunities.

2.2 From the perspective of Weakness (劣势) analysis

2.2.1 Lack of practical experience

Some students majoring in financial management lack sufficient practical experience, which makes it difficult for them to flexibly apply their learned knowledge when facing practical problems. This, to a certain extent, affects their employment competitiveness.

2.2.2 Out-of-date course settings

Some curriculum designs for financial management majors lag behind the latest trends in industry development, failing to promptly introduce new theoretical and practical achievements. This may result in students needing to spend extra time and effort to learn and adapt to new knowledge and skills after graduation.

2.2.3 Uneven distribution of teaching staff and educational resources

The distribution of teaching staff and educational resources is uneven across different regions and institutions. In some regions and institutions, the teaching staff for financial management majors may be relatively weak, lacking teachers with rich practical experience and profound theoretical knowledge. This results in disparities in educational quality and practical opportunities for some students, significantly impacting their learning outcomes and the teaching quality of the schools.

2.3 Analyzing from the perspective of Opportunity (机会)

2.3.1 policy support

The government's emphasis on financial management majors has been continuously increasing, and it has issued a series of related policies to support the development of the financial management industry. For instance, policies promoting standardization in financial management and supporting technological innovation have been proposed at national conferences, providing students of financial management majors with more employment opportunities and development space.

2.3.2 International development

With the acceleration of globalization, the internationalization trend of financial management has become increasingly apparent. Many universities have introduced International Financial Reporting Standards (IFRS) into their financial management curricula, using cases from international corporations for teaching. Internationally recognized courses and exams, such as the Certified Public Accountant (CPA) and Chartered Financial Analyst (CFA), help students understand financial management practices in different countries and regions, fostering their international perspective and cross-border reporting abilities. Students can obtain internationally recognized degrees, enhancing their international competitiveness.

2.4 Analyzing from the Threat (威胁) perspective

2.4.1 Risk of replacement by technology

With the development of artificial intelligence and automation technologies, some traditional financial management positions may face the threat of being replaced by technology, impacting the job market. This requires students majoring in financial management to continuously learn new knowledge and skills in order to adapt to industry changes and ensure sustainable development.

2.4.2 Impact of economic fluctuations

The uncertainties and cyclical fluctuations in the global economy may have a certain impact on the development of financial management majors. For example, economic recessions may lead enterprises to reduce financial investments, thereby affecting the demand for financial management talents and their employment prospects.

3. Result and Discussion

3.1 AI Enriches Educational Methods

AI empowers financial education, enhancing students' learning efficiency and quality. The application of AI is not limited to traditional data and case retrieval; it demonstrates unique advantages in data summarization, case integration, and other aspects. Especially in basic courses such as accounting subject processing, rapid identification of financial data, and processing of voucher invoices, the integration of Artificial Intelligence Generated Content (AIGC) technology has brought revolutionary changes to teaching.

3.2 AI-based exam review and grading

In traditional accounting and finance teaching, teachers often need to grade students' assignments one by one and point out errors. However, with the help of AI, this grading process becomes more efficient and accurate. AI can promptly point out specific issues from a professional perspective, such as errors in accounting subjects or data calculations, while providing correct answers and explanations. Moreover, AI can present similar cases for practice, helping students quickly grasp similar problems. This instant feedback mechanism not only improves students' learning efficiency but also cultivates their self-correction abilities.

3.3 Application of AI Technology in Cultivating Financial Thinking and Enhancing Technical Skills

3.3.1 AI provides simulated business environments

Build virtual markets and trading systems.Using AI technology for practical training expands the practice space for financial professionals by constructing virtual markets and trading systems. AI technology can simulate trading behaviors, price fluctuations, supply and demand relationships in real markets, providing a highly simulated business environment for students majoring in financial management. In this environment, students can engage in virtual investment decisions, capital operations, cost control, and other financial management activities, thereby exercising their practical operation abilities. Through advanced technologies such as deep learning and natural language processing, AI can simulate human business environments to generate a large amount of financial data, including historical and real-time data. Students only need to input keywords or descriptive text, and AI can quickly provide relevant cases and their data in a "human-AI collaboration" model. This not only improves learning efficiency and cultivates their financial practical thinking and skills but also

teaches them how to combine AI technology with practice, laying a solid foundation for their future career development.

3.3.2 Automation of financial processes and report generation

Intelligent expense reimbursement management. Automatically process employees' reimbursement applications, including the upload of electronic invoices, approval processes, and payment processing. RPA (Robotic Process Automation) technology can support multi-channel acquisition of invoice information, automatically identify, classify, summarize, and distribute various invoices and documents. It also automatically generates reimbursement forms and initiates approval requests. Upon approval, it automatically generates payment vouchers and executes payment operations.

Intelligent Purchase Payment Process: Automating processes such as request for payment processing and purchase payments. RPA robots can scan request for payment forms and recognize relevant information, automatically completing tasks such as review, data entry, and payment preparation (including automation of business processes such as contract management, invoice issuance, revenue recognition, and payment reconciliation). RPA robots can issue invoices based on order information, automatically reconcile accounts receivable, and send reconciliation reminder emails. Additionally, they can obtain data from banks, automatically claim incoming payments, and synchronize them into the accounting system for payment write-off.

Intelligent General Ledger Report Generation and Tax Processing: RPA robots can assist in tasks such as account closing, standard journal entry processing, related party transaction handling, reconciliation, and financial statement issuance. RPA robots can automatically perform various account closing tasks, periodically record and carry forward accounting entries, achieve automatic related party transaction processing, and complete reconciliation and reconciliation statement printing tasks. Additionally, RPA robots can independently complete data aggregation, consolidation offsets, email data collection, system data export and processing, and automatically issue templated individual and consolidated reports. Various financial statements such as balance sheets, income statements, and cash flow statements can be automatically generated. Tax declarations and payments are processed automatically to ensure tax compliance.

By combining this artificial intelligence with basic financial processes, students can clearly understand the practical applications of finance in the future and subtly enhance their financial thinking and skills through routine basic course exercises.

AI-assisted Construction and Effectiveness of Intelligent Education Platforms

AI-Assisted Framework Construction for Intelligent Education Platforms

Establishing the Basic Financial Data Layer of the Platform

Firstly, clarify data requirements and standards. Conduct an in-depth analysis of the needs of financial management majors in universities to clarify the types, formats, and quality requirements of the required data. Establish unified standards for data collection, storage, and processing to ensure data accuracy and consistency.

Secondly, build a data architecture. Based on data requirements, design a reasonable data architecture, including data layering, data modeling, and database design. Introduce advanced database management systems to improve data storage and processing efficiency.

Thirdly, implement data collection and integration. Adopt automated data collection methods, clean, convert, and integrate the collected data to eliminate data redundancy and errors.

Fourthly, establish a data governance system. Set up a data quality monitoring mechanism. Formulate data governance strategies and norms, clarify data ownership, usage rights, and management rights, regularly conduct quality inspections and assessments of data, and strengthen data security and privacy protection. Adopt technical means such as data encryption, access control, and auditing to ensure data security and privacy protection. Regularly conduct risk assessments and vulnerability scans on data security to identify and fix potential security risks in a timely manner.

Fifthly, promote data integration and sharing. Establish a data sharing platform to enable cross-departmental and cross-regional data sharing and exchange. Formulate data sharing rules and standards to ensure data compliance and consistency.

Establish the Intelligent Technology Engine Layer and Application Layer of the Platform

Firstly, technology selection and architecture design. Choose intelligent technologies suitable for the platform's needs, such as deep learning, machine learning, and natural language processing. Design a reasonable architecture, including data layer, algorithm layer, and application layer, to ensure the efficient operation and scalability of the engine. The intelligent technology engine layer can provide personalized learning resources and recommendations for students based on their learning habits, interests, and abilities. This personalized learning experience can stimulate students' interest and motivation in learning, thereby improving their learning outcomes.

Secondly, algorithm development and optimization, platform integration, and testing. Develop corresponding algorithms according to the platform's needs, such as recommendation algorithms and prediction algorithms. Continuously optimize the algorithms to ensure the stability and reliability of the engine. The combination of efficient learning support and the intelligent technology engine layer enables real-time analysis of students' learning data, identifying their learning difficulties and weaknesses. Through intelligent tutoring and Q&A systems, timely and accurate learning support is provided to students to help them solve learning problems.

Thirdly, continuous monitoring and maintenance, as well as protection of data privacy and security. While artificial intelligence brings great convenience, it inevitably leads some students to become lax and seek shortcuts, relying on AI and platform learning tools for assignments. The platform analyzes students' operations to assess the possibility of misuse and provides reminders accordingly. When enjoying the convenience brought by intelligent technologies, students also need to pay attention to data privacy and security issues. The platform should establish a comprehensive data protection mechanism to ensure that students' personal information and learning data are not leaked or abused.

The Effectiveness of AI in Assisting the Construction of Intelligent Education Platforms

Intelligent teaching platforms constitute a vital component in modern curriculum education. The integration of AI technology can better support personalized teaching, intelligent management, precise evaluation, and other aspects, with the application of AIGC technology in teaching platform construction being particularly notable. By empowering AI, the quality and efficiency of education are enhanced, meeting diversified and personalized learning needs. Firstly, traditional teaching of financial management majors faces issues such as uneven distribution of teaching resources and monotonous teaching methods. AI intelligent teaching platforms address these pain points, bringing new opportunities for sustainable innovation in the teaching of financial management majors. AI technology breaks through the limitations of time and space, enabling widespread sharing of high-quality educational resources and providing financial practice opportunities. It offers students personalized learning paths and abundant learning resources, allowing them to independently choose learning content based on their progress and interests, thereby achieving true personalized learning. Intelligent feedback systems can promptly correct students' errors during the learning process, enhancing their learning outcomes. AI-empowered intelligent teaching platforms help students master professional knowledge in financial management while cultivating skills related to data analysis, machine learning, and other areas, thereby nurturing composite talents who are proficient in both finance and technology.

Intelligent teaching platforms, serving as auxiliary tools, provide teachers with abundant teaching resources and advanced teaching tools, such as intelligent lesson preparation systems and online learning platforms. These innovative tools greatly alleviate teachers' burden of lesson preparation and enhance teaching efficiency. With the help of intelligent platforms, teachers can quickly integrate teaching resources, further improving teaching efficiency. Based on educators' teaching directions and students' interactive feedback, intelligent teaching platforms develop in-depth teaching content and strategies. This interactive teaching mode not only realizes personalized customization of teaching content but also maximizes the utilization of AI data analysis and content creation capabilities, thereby enhancing the "teaching-learning" experience. The application of AI technology in education has opened up a new path, especially in creating personalized and highly adaptable learning environments that meet individual learning needs.

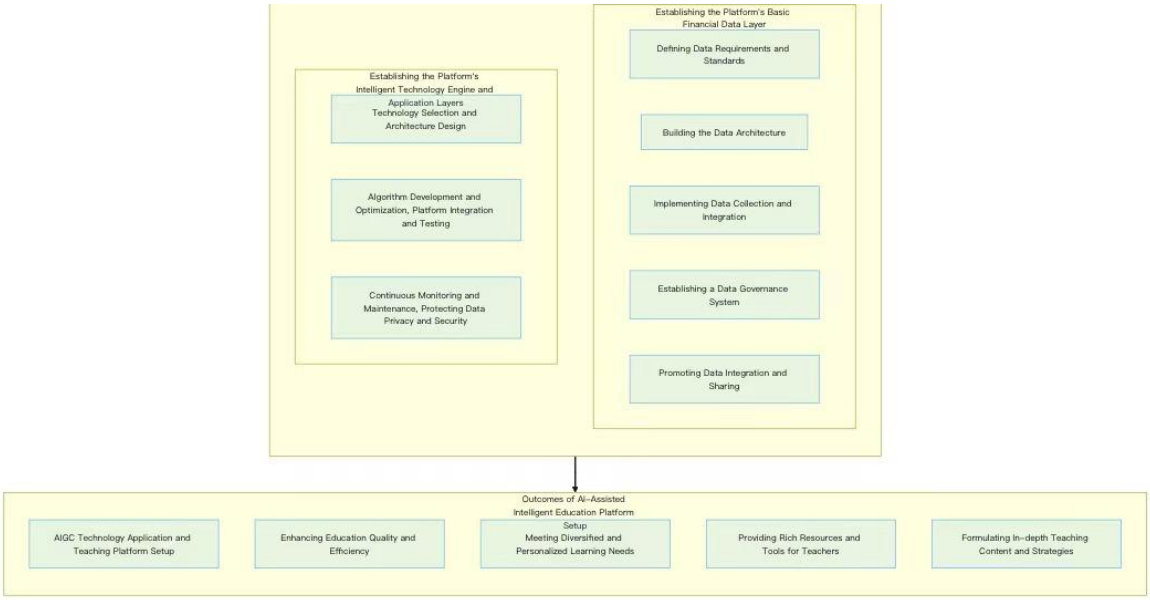

Fig.1 AI-Assisted Intelligent Education Platform Architecture Setup

4. Conclusion

In summary, this paper employs the SWOT analysis method to examine the current environment of financial management education in Chinese universities, focusing on four aspects: strengths, weaknesses, opportunities, and challenges faced. It also identifies some existing issues. With a spotlight on the diverse application scenarios of AI technology in education, it is evident that AI not only brings data integration, case analysis, real-time modifications, and simulation of business environments to basic financial courses but also emphasizes the integration of theory and practice, enhances financial professionalism, cultivates students' financial thinking, and upgrades financial skills. Furthermore, the establishment and application of AI in intelligent teaching platforms diversify and personalize teaching, promoting sustainable development and innovation in financial management education, which is of great significance to assisting financial management education. In this context, universities can further tap into the potential of AI technology in improving teaching quality and enhancing students' comprehensive qualities by strengthening teacher training, optimizing curriculum design, and introducing university-enterprise collaborations. These efforts aim to cultivate outstanding talents with both innovative and practical abilities.

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