

Research on the Training Mode of Innovative and Entrepreneurial Talents in Financial Management under the Background of Big Data: A Case Study of Xiamen University of Technology

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Abstract: Under the big data environment, Xiamen University of Technology, centering on the teaching links for cultivating innovative and entrepreneurial talents of undergraduates majoring in financial management, enables students to master the basic knowledge and methods in management, economics, law, taxation, big data, mathematics, as well as engineering training and innovation and entrepreneurship training. Students are equipped with basic skills in accounting and finance, certain humanistic and scientific literacy, along with capabilities in innovation, entrepreneurship and big data analysis. In response to the new technologies of the big data era, Xiamen University of Technology has carried out teaching reforms for talent cultivation in the financial management major. With school-enterprise cooperation as the main driving force, it has optimized the talent cultivation program for the financial management major, organically integrated the big data environment with innovation and entrepreneurship projects and teaching objectives, and constructed a reformed teaching mode for the financial management major that promotes students' innovation and entrepreneurship projects, aiming to cultivate compound high-quality talents with innovative and entrepreneurial capabilities.

Keywords: Big Data; Financial Management Major; Innovation and Entrepreneurship-oriented; Talent Cultivation Mode

1. Introduction

Since 2012, the Ministry of Education of the People's Republic of China has issued explicit regulations on entrepreneurship education in regular undergraduate institutions, emphasizing that undergraduate education should prioritize the cultivation of professional talents with innovation and

entrepreneurship capabilities. The core objectives include fostering students' awareness of innovation, and striving to develop innovative and entrepreneurial talents who possess a strong spirit of innovation and the courage to engage in practical endeavors. In 2018, the Ministry of Education further clarified the new "Artificial Intelligence + X" interdisciplinary talent cultivation model, and required the development of distinctive interdisciplinary programs under the framework of "Artificial Intelligence + X". In 2021, the Ministry of Finance released Outline of the 14th Five-Year Plan for Accounting Reform and Development, demanding "earnestly accelerating the pace of digital transformation in accounting and auditing". Emerging technologies such as "big data, artificial intelligence, mobile internet, cloud computing, and the Internet of Things" have been elevated to the national strategic level. In the era of "big data, artificial intelligence, mobile internet, and cloud computing", the cultivation of financial management talents must integrate new technologies. Future financial management talents must have the ability to process massive amounts of data, extract valuable information from big data, and conduct analysis and utilization.

The traditional training model for financial management talents can hardly meet the requirements imposed by informatization development on such talents. In traditional financial management education, there are multiple prominent issues that restrict the cultivation of high-quality talents: first, both teachers and students have an insufficient in-depth understanding of "innovation and entrepreneurship" education; second, the professional talent training programs are barely capable of bearing the goal of cultivating "innovation and entrepreneurship"-oriented talents; third, "innovation and entrepreneurship" education lacks specific practical links and platforms; fourth, there is a shortage of faculty resources specialized in

"innovation and entrepreneurship" education, and the interdisciplinary comprehensive capabilities of the existing "innovation and entrepreneurship" faculty team are insufficient—while they possess abundant theoretical knowledge, they are deficient in practical operation experience. These problems collectively result in limitations in practical guidance. Meanwhile, the weak awareness of innovation also leads to insufficient flexibility in teaching guidance. How to integrate innovation and entrepreneurship education with financial management professional education has become a key challenge faced by the talent cultivation of financial management major.[1]

Against the above background, it is of great significance to study the cultivation model of innovative and entrepreneurial talents for the financial management major in engineering colleges under the big data environment.

2. Current Situation of Cultivating Innovative and Entrepreneurial Talents in Financial Management Major at Xiamen University of Technology

2.1 The Financial Management Major has a Long History and Attaches Importance to Cultivating Innovative and Entrepreneurial Talents

In 2020, the Financial Management major of Xiamen University of Technology was recognized as a university-level first-class major.

The Financial Management major has been incorporated into the International Undergraduate Academic Recognition Program (IUP) system of the Oriental International Education Exchange Center under the China Scholarship Council (CSC). This program is an international education curriculum reform initiative designed for regularly enrolled university students who aspire to pursue further studies in the United States. Additionally, Financial Management (Wealth Management Track) is a cooperative program between the university and external partners, implementing a "4+0" cooperative education model.

The Financial Management major has won numerous awards in various discipline competitions and other fields at the national, provincial, municipal, and university levels. For example, it has won the national special prize in the National College "Creativity, Innovation, Entrepreneurship" Financial Management Challenge and National College Students' Financial Management Competition. It has also received collective honors such as the provincial advanced class, civilized class, and five-star league

branch. The employment rate of graduates has remained above 90% annually, with graduates working in government functional departments, various financial institutions, foreign trade companies, financial companies, etc. Some graduates have chosen to start their own businesses, pursue postgraduate studies, or study abroad.[2]

2.2 The Financial Management Major has an Excellent Teaching Team

The Financial Management program boasts a teaching faculty with rich teaching experience and a well-structured echelon, consisting of 22 full-time teachers. Among them, there are doctoral degree holders in accounting and finance from more than 10 provinces, as well as teachers with work experience in enterprises or other public institutions. The teachers mainly graduated with doctoral degrees from Xiamen University, Fuzhou University, Huaqiao University, and Technology, Harbin Institute of Technology, Nanchang University, Guilin University of Electronic Technology, etc. Associate professors account for a relatively large proportion. In recent years, 5 to 7 doctoral degree holders have been recruited.

2.3 The Financial Management Major has Solid Experimental Conditions and Internship Training Foundations

Adhering to the educational philosophy of "taking employment needs as the orientation and ability cultivation as the main line", the Financial Management major emphasizes the combination of theoretical teaching and practical application, and focuses on cultivating applied talents. It has the E-Commerce Research Center of the Fujian, as well as 14 laboratories including the Business Comprehensive Training Center and the Economic Comprehensive Simulation Laboratory, which are co-constructed by the central and local governments under the Ministry of Finance. Specifically, these laboratories include: Economic Practice Comprehensive Simulation Laboratory, Financial Comprehensive Training Room, Kingdee Management Software Joint Laboratory, Accounting Computerization Laboratory, Information Management and Information System Laboratory, Sandtable Operation Practical Training Room, and Economic Management Comprehensive Business and Certification Training Room.

Among them, the Financial Comprehensive Training Room was established in 2000. Initially named "Accounting Manual Simulation

Laboratory", it was later renamed "Financial Comprehensive Training Room" with a total area of 131 square meters. Courses with experimental components offered in these laboratories, such as Simulation Exercise on Accounting Data Generation in the Financial Comprehensive Training Room, ERP System Simulation Training in the Kingdee Management Software Joint Laboratory, Excel and Financial Management in the Accounting Computerization Laboratory, Special Analysis on Financial Management Cases in the Case Analysis Room, Investment Science in the Financial Transaction Simulation Laboratory, and Management Information System in the Information Management and Information System Laboratory, have helped students deepen their understanding of theoretical knowledge.

The Kingdee Management Software Joint Laboratory is a teaching platform provided by the center for students of various majors. The laboratory is equipped with 61 microcomputers, network technology experimental equipment, small switches, and other network devices. In cooperation with Xiamen Kingdee Software Co., Ltd., the laboratory has introduced Kingdee Finance, K3 ERP, and other software, which greatly facilitates the study and research of professional courses.

3. Dilemmas in Cultivating Innovative and Entrepreneurial Talents in Financial Management Major at Xiamen University of Technology

Although there is a solid foundation for reforming the training mode of innovative and entrepreneurial talents in accounting and finance majors under the big data environment, there are still areas that need further improvement:

3.1 Integration of Financial Management with the Big Data Context

Firstly, the curriculum needs more forward-looking. The curriculum design of traditional financial management is no longer compatible with the development of informatization. In the big data era, new financial management industries have emerged. Merely offering courses on financial management informatization is far from sufficient, as it lacks forward-looking. There is an urgent need to enrich relevant big data courses to meet the demands of intelligent financial digitization for financial management talents.

Secondly, the integration of theoretical and practical courses needs to be strengthened.

The cultivation of interdisciplinary financial

management talents must align with social needs, with enhanced practical teaching. However, in reality, the integration of big data with theoretical and practical content in financial management courses is insufficient, leading to a tendency of "valuing theory over practice." Even financial practice sessions sometimes become a mere formality.

Thirdly, teaching resources need to be enriched.

The application of big data technologies in financial management is imperative, which requires substantial practical platforms and teaching resources, such as data analysis software, financial sharing systems, and financial robots. Enriching these resources will better promote the integration of big data and financial management.[3]

3.2 Alignment of Innovative and Entrepreneurial Education with Talent Cultivation Objectives

The objective of financial management programs in application-oriented universities is to cultivate professionals capable of undertaking financial work in enterprises, institutions, and financial sectors. They are trained to master professional knowledge and practical skills in tax planning, financial management, accounting, and auditing to meet the needs of China's market economy development. However, innovative and entrepreneurial education focuses on cultivating interdisciplinary applied talents with independent entrepreneurial capabilities, fostering entrepreneurial awareness, and equipping them with entrepreneurial knowledge.

Innovative and entrepreneurial education and accounting education each have clear, distinct goals, characteristics, and standards for talent cultivation. These differing objectives hinder their effective integration, resulting in mismatches between innovative and entrepreneurial courses and core financial management courses. This often leads to superficial theoretical discussions in professional courses and limited exposure to basic theories in entrepreneurship courses.[4]

3.3 Improvement of Curriculum Systems for Innovative and Entrepreneurial Education and Professional Education

There are issues such as separation between entrepreneurial education courses and financial management professional courses, incomplete curriculum evaluation systems, and outdated assessment methods. Financial management curricula tend to emphasize professional theoretical courses and public basic courses, often neglecting interdisciplinary courses. Innovative and

entrepreneurial courses are inadequately offered; even when available in some institutions, they merely deliver theoretical knowledge and are often compressed into a few weeks, further isolating them from financial management professional education. Thus, application-oriented universities should increase the proportion of innovative and entrepreneurial courses and interdisciplinary practical courses in finance. Although some universities have established "simulated + real-world" financial accounting laboratories, these have not been effectively integrated with innovation and entrepreneurship initiatives. Innovation and entrepreneurship elements are absent from accounting and financial training, and there is a lack of on-campus and off-campus bases for innovative, entrepreneurial, and financial practices. Additionally, in terms of curriculum evaluation, most courses still rely on exam scores as the primary criterion, ignoring assessments of process, practical abilities, and comprehensive quality.[5]

3.4 Reform of Teaching Methods in Innovative and Entrepreneurial Education and Professional Education

Currently, teaching methods in both innovative and entrepreneurial education and financial management professional education remain overly simplistic, failing to fully engage students' initiative or effectively stimulate their innovative and entrepreneurial thinking. In actual teaching, cases used are often poorly integrated with course content, making it difficult to inspire independent thinking or foster students' innovative mindset.

4. Talent Cultivation System for Financial Management Major in the Big Data Environment

A "one-body-two-wings" curriculum system for financial management is constructed, with professional knowledge of financial management as the "body" and big data and innovation & entrepreneurship education as the "two wings".

With the goal of cultivating innovative talents in financial management under the background of big data, efforts should be focused on the following tasks: establishing big data laboratories and university students' innovation platforms, attaching importance to the construction of internship bases and school-enterprise cooperation training mechanisms; improving teachers' big data analysis capabilities and practical teaching abilities, perfecting the second classroom and innovation activity mechanisms, and strengthening the

practical teaching quality standards and quality monitoring system. Through the integration of in-class and after-class learning, and the linkage between on-campus and off-campus resources, various practical activities such as social practice, training certification, discipline competitions, innovation projects, and comprehensively improve graduates' practical ability, innovation ability, as well as the abilities of creativity, innovation, entrepreneurship, and creation.[6]

4.1 Core Courses of the "Body": Professional Knowledge of Financial Management

Including Management, China's Tax System, Financial Management, Economic Law, Finance, Corporate Governance, Intermediate Financial Accounting, Cost Management Accounting, Corporate Strategy and Risk Management, Tax Planning, Auditing, and Principles of Accounting. These courses aim to cultivate interdisciplinary talents with solid foundational knowledge in economics, finance, management, information technology, engineering practice, and law, as well as profound professional knowledge in financial management. They should possess a broad international perspective, strong adaptability to the environment, good psychological quality, the ability to analyze and make decisions in fundraising, investment, profit distribution, cost control, budgeting, and performance evaluation, strategic management and risk control capabilities in an information-based environment, and the ability to re-learn professional knowledge and innovate.[7]

4.2 Core Courses of the "Two Wings": Big Data and Innovation & Entrepreneurship Education

Big data courses: Big Data Management, Big Data Processing, Intelligent Accounting Information Systems, Big Data Financial Analysis, Big Data and Intelligent Financial Decision-Making, Data Mining, and Financial Robots.

Innovation & entrepreneurship courses: Fundamentals of Entrepreneurship, Career Planning and Employment Guidance for College Students, Innovative and Entrepreneurial Management Thinking in the Big Data Era, Practice of Small and Medium-Sized Enterprise Entrepreneurship, Understanding Entrepreneurship, and Introduction to Entrepreneurship and Entrepreneurial Preparation.

4.3 Adoption of a Four-Dimensional Teaching Method Combining Online and Offline Learning

In the era of big data, the financial management

major utilizes resources such as online courses, MOOCs, and micro-courses, and adopts teaching methods such as group discussion, scenario discussion, case discussion, and project discussion to guide students to participate in practical activities, enhancing the interactivity and effectiveness of teaching.[8]

Group discussion teaching method: Students are divided into groups of 4-6 people to discuss a specific topic related to financial management innovation and entrepreneurship; each student's performance in group reports is recorded as part of their usual grades.

Scenario discussion teaching method: Introduce scenarios of financial management innovation and entrepreneurship, construct corresponding teaching chapters or knowledge frameworks; discussions are carried out around specific situations in financial management and innovation & entrepreneurship.

Case discussion teaching method: Teachers play financial management cases and innovation & entrepreneurship cases for students, who then learn through group cooperation and exploration. Students in the group reasonably use big data technology to extract relevant information, process and analyze such information, and share their learning results within the group.

Project discussion teaching method: An active learning method that takes "projects as the main line, teachers as guides, and students as the main body". It emphasizes active, interactive, and collaborative learning, creates an interesting learning atmosphere, and improves students' participation. Teachers guide students to research and reflect on projects, enabling students to continuously improve their professional skills as well as innovation and entrepreneurship capabilities.

5. Countermeasures and Suggestions

5.1 Improving the Training Objectives for Innovative and Entrepreneurial Talents in Financial Management under the Background of Big Data

Financial management talents cultivated in the big data environment should be able to adapt to the development of information technology.

The financial management major is committed to cultivating advanced applied talents who meet the needs of economic and social development, develop morally, intellectually, physically, aesthetically, and laboriously, and possess innovative qualities. These talents should master basic knowledge and methods in management, economics, law, taxation,

organizational behavior, mathematics, and engineering training, have basic accounting and financial skills as well as certain humanistic and scientific literacy, and be proficient in big data analysis. They should be capable of engaging in financial management work such as fund raising, investment management, fund management, and capital operation in enterprises, institutions, government departments, and other social organizations, as well as related work in accounting firms, and gradually grow into technical backbones or middle and senior management experts in the field.[9]

By introducing big data and informatization, the financial management major integrates innovative and entrepreneurial thinking into teaching, achieves the goal of "integration of business and finance", emphasizes the combination of "learning and practice" with "innovation and entrepreneurship", and optimizes the talent training program.

5.2 Constructing a Curriculum System for Innovative and Entrepreneurial Financial Management Talents

First, to cultivate innovative and entrepreneurial financial management talents with high moral standards in the era of big data, three key measures should be implemented: firstly, we must fulfill the fundamental task of fostering virtue through education and cultivate talents who dare to take responsibility and strive for excellence; secondly, we should add comprehensive education courses such as mental health education and career guidance; thirdly, we must uphold the professional ethics of accounting that "no false accounts shall be made", and develop financial management talents with all-round development of morality, intelligence, physical fitness, aesthetics and labor skills, who possess noble political and ideological qualities, good physical health and sound psychological qualities.

Secondly, to cultivate innovative and entrepreneurial financial management talents with strong data literacy in the era of big data, it is necessary to implement the "Big Data + Financial Management" integrated professional curriculum. With the application of information technology in the financial field, financial work has become increasingly automated, digitalized and intelligent. Therefore, additional courses such as Big Data Management, Big Data Processing, Intelligent Accounting Information Systems, Big Data Financial Analysis, Big Data and Intelligent Financial Decision-Making, Data Mining, and

Financial Robots should be offered.

Thirdly, to cultivate innovative and entrepreneurial financial management talents with high intelligence quotient and emotional quotient in the era of big data, it is necessary to customize a "innovation and entrepreneurship + professional skills" curriculum system. On the premise of strengthening theoretical knowledge courses and public basic courses, appropriate innovative and entrepreneurial elective and compulsory courses can be added, such as Practice of Small and Medium-Sized Enterprise Entrepreneurship, Understanding Entrepreneurship, and Introduction to Entrepreneurship and Entrepreneurial Preparation. Using large-scale open online courses (MOOCs) under "big data + education", we can offer corresponding innovative and entrepreneurial elective courses and adopt the online-offline hybrid teaching mode to improve students' autonomous learning ability. We should effectively integrate innovative and entrepreneurial content with financial management professional knowledge, and incorporate innovative and entrepreneurial knowledge into financial management professional classrooms. While guiding students to study courses such as financial law and economic law, we should teach them to handle the registration and organizational forms of start-ups; while learning accounting courses such as accounting management and financial accounting, we should teach them to deal with issues such as controlling the start-up costs and calculating profits of enterprises. Since innovation and entrepreneurship require mastering relevant knowledge points and operational abilities in finance, taxation, and finance, and it is particularly emphasized that the cultivation of college students' practical operation capabilities should not be neglected.[10]

5.3 Reform of Educational and Teaching Methods

Application-oriented universities should develop a teaching faculty that combines full-time and part-time teachers. In the teaching process, teachers should attach importance to cultivating students' innovation and entrepreneurship capabilities as well as their proficiency in information technology.

Application-oriented undergraduate institutions need to effectively integrate cutting-edge knowledge of big data development at home and abroad, draw on advanced international financial management experience, and apply it to domestic financial management practices. Meanwhile, they should invite outstanding entrepreneurs, innovators,

or experts in the financial field to provide online or on-site guidance to college students. At the same time, opportunities should be provided for college teachers to participate in on-site learning in frontline enterprises, so as to build a "dual-qualified teaching team" with both innovation and entrepreneurship capabilities and professional theoretical knowledge. This will enable the college teaching faculty to possess the characteristics of "high awareness of innovation, strong entrepreneurial ability, rich practical experience, and good professional literacy", and effectively integrate the teaching characteristics of the financial management major with the needs of innovation and entrepreneurship education into teaching methods.

For curriculum teaching, it is necessary to explore the essence of teaching methods such as task-driven teaching and case teaching, and use teaching methods such as MOOCs and micro-courses on big data platforms to improve students' ability of active thinking. Through the analysis of practical cases, students can understand professional knowledge, and then effectively use the mastered professional knowledge to solve problems in innovative and entrepreneurial tasks, so as to stimulate students' learning initiative. For example, we can promote school-enterprise cooperation methods such as "industry-academia integration", "work-study integration", and "job-oriented training" to promote in-depth reform of the talent training model.

We should take advantage of school-enterprise cooperation to establish on-campus and off-campus practical bases for accounting majors and innovative and entrepreneurial talents. At the same time, we can regularly hold activities such as business simulation competitions and accounting knowledge competitions to enrich students' extracurricular life, thereby improving their professional ability and providing them with practical training opportunities. We should deepen school-enterprise cooperation: first, cooperate with enterprises to carry out projects such as financial big data analysis and financial intelligent application, allowing students to participate in actual project operations to improve their practical ability; second, establish school-enterprise cooperation bases to provide students with internship and training opportunities and promote the integration of production, education, and research; third, introduce the enterprise tutor system, inviting industry experts with rich practical experience to participate in practical teaching and provide guidance.

5.4 Improving the Construction of Teaching

Resources and Platforms

In the era of big data, improving the construction of teaching resources and platforms for the financial management major is crucial for enhancing teaching quality and fostering students' ability to meet the demands of the new era. Great importance must be attached to the development of professional resource platforms for financial management. For instance, a comprehensive professional electronic teaching resource platform integrating various teaching resources—such as textbooks, courseware, cases, and exercises—should be built, equipped with powerful search and recommendation functions. This platform not only provides teachers with abundant teaching materials but also enables students to access the platform for learning even when off-campus, thereby improving learning efficiency. Additionally, by leveraging big data and artificial intelligence technologies, students' learning processes can be tracked and analyzed to provide them with personalized learning suggestions and feedback.

Secondly, the development and application of digital teaching resources should be strengthened. Information technology should be adopted to convert traditional paper-based teaching resources into digital formats, such as e-textbooks and online videos. This allows students to access resources more conveniently while also facilitating teachers in conducting remote teaching and tutoring.

Furthermore, emphasis should be placed on the development of practical teaching resources. In-depth cooperation with enterprises is essential to jointly develop practical teaching cases, projects, and school-based textbooks, enabling students to strengthen the application of their professional knowledge through practice.

Finally, it is also necessary to establish and improve the maintenance and management mechanism of the teaching resource platform. Teaching resources should be regularly updated and maintained to ensure their accuracy and timeliness. At the same time, the management and guidance for students' use of the platform should be enhanced to ensure that students can fully utilize the platform resources for learning.

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under the Big Data Environment.

References

- [1] Zhao J Y, Lu J. Theory and Practice of Accounting Education Reform in Colleges and Universities under the Background of Big Data: Evaluating the Basis of Financial Big Data. *China Sciencepapers*, 2022 (4): 486.
- [2] Cheng P, Tao S Y. Teaching Design of MPAcc Financial Sharing Course Based on ADDIE: A Case Study of Chongqing University of Technology. *Finance and Accounting Monthly*, 2018 (22):24-29.
- [3] Zhang M, Jia L, Shi C L. A Study on the Demand for Intelligent Financial Talents against the Background of Digital Economy:An Empirical Analysis Based on Questionnaire Data. *Journal of Xiamen University (Arts & Social Sciences)*, 2023, 73 (2): 56-68.
- [4] Tan Y L. Research on the training path of big data and financial management professionals in finance and economics higher vocational colleges: based on the perspective of SWOT analysis. *Journal of Taiyuan Urban Vocational College*, 2022 (3): 75-77.
- [5] Huang X M. Reconstruction of the innovative personnel training mode for the financial management major in the digital age: a case study of Minjiang College. *China Internet Week*, 2024 (05): 68-70.
- [6] Ye M M. Discussion on the design of financial management professional curriculum system under the background of Internet big data. *Commercial Accounting*, 2020 (1): 117-119.
- [7] Wu T, Cheng X J. Strategies for Cultivating Applied Accounting Talents Based on the OBE Concept. *Industrial & Science Tribune*, 2021 (20): 192-193.
- [8] Cheng P, Ji W. Teaching Design of "Internet Accounting" MPAcc Course Based on ISD: A Case Study of Chongqing University of Technology. *Finance and Accounting Monthly*, 2018 (24): 33-37.
- [9] Guo X L, Chen P Z. Exploration of the Path for Cultivating Innovative Financial Management Talents in Application-Oriented Undergraduate Colleges under the Background of Big Data. *Economic Outlook the Bohai Sea*, 2024, (07): 138-141.
- [10] Ou L. Exploration of the Cultivation of Innovative Financial Management Talents in Enterprises under the Talent-Strong-Country Strategy. *Modern Business Trade Industry*, 2024, 45 (15): 255-257.