

Research on the Collaborative Mechanism for Cultivating Top-notch Innovative Talents in Financial Technology

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Abstract:

This paper conducts an in-depth study on the innovation and entrepreneurship education model for financial technology (FinTech) talents. It analyzes the key elements of such education, including the importance of industry-education integration and the construction of a comprehensive cultivation system. By analyzing the critical elements of FinTech talent cultivation—such as industry-education integration, modular curriculum design, and tiered competition systems—this research proposes a “one core and five dimensions” collaborative model. The “one core” emphasizes cultivating talents to serve national strategic needs, while the “five dimensions” encompass course foundations, research leadership, practice-driven learning, competition platforms, and innovation goals. Through a case study of Z University’s School of Information, the paper highlights effective practices, including mentorship programs, virtual-real integrated laboratories, and competition-driven training. Finally, it emphasizes that all parties should work together to improve the cultivation system and promote the high-quality development of innovation and entrepreneurship education.

Keywords:

Financial Technology Talents, Innovation and Entrepreneurship Education, Cultivation Model

1. Introduction

In the context of intensifying global competition for technological dominance, the cultivation of top-notch FinTech talents has become a strategic imperative. The 20th National Congress of the Communist Party of China underscored the pivotal role of education, technology, and talent in achieving socialist modernization [1]. However, China’s innovation and entrepreneurship education system faces structural challenges, including a mismatch between academic training and industry demands, insufficient interdisciplinary integration, and underdeveloped support mechanisms for student startups.

As a leading institution in finance and economics higher education, Z University faces the urgent task of cultivating top-notch FinTech talents to serve national strategies. For a long time, Z University has played a leading and exemplary role in financial and economic innovation and technology, especially achieving remarkable results in the cross - integration of block chain, artificial intelligence, and the financial and economic fields. With the rapid development of globalization and technology, innovation and entrepreneurship have become the main drivers of economic growth. After years of development, governments and societies around the world have gradually shifted the focus of education to innovation and entrepreneurship education, believing that it is crucial for regional economic development and the improvement of people's living conditions. This research aims to construct an innovation and entrepreneurship education model of “One Core and Five Dimensions”. Taking the cultivation of top-notch FinTech talents to serve national strategies as a breakthrough point, it forms a cultivation model for such talents with courses as the foundation, scientific research as the forerunner, practice as the starting point, competitions as the carrier, and innovation as the goal. It explores the organic combination of multiple subjects such as universities, students, the government, platforms, and intermediaries to promote the development of innovation and entrepreneurship education in finance and economics universities.

2. Key Elements of Innovation and Entrepreneurship Education for Financial Technology Talents

2.1. Importance of Industry-Education Integration

Industry-education integration is one of the key elements of innovation and entrepreneurship education. By combining education with industry needs, it can significantly enhance students' practical skills and innovation potential. Scholars at home and abroad generally believe that university talent cultivation should be combined with the needs of industrial sectors, and a curriculum system that connects technical learning with innovation and entrepreneurship education should be constructed. As a key element of innovation and entrepreneurship education, industry-education integration is triggering a profound transformation of the higher education system globally.

At the practical level, the school-enterprise collaborative education mechanism shows a diversified development trend. Leading technology companies such as Huawei and Xiaomi have transformed cutting-edge technology standards into teaching resources by jointly building industrial colleges and developing certification curriculum systems. Innovation practice platforms such as Tsinghua University x-lab have constructed a three-level cultivation system of “course training - project incubation - industry connection”, and have nurtured multiple high-tech start-up projects in the past five years. This in-depth integration is not only reflected in the co-construction and sharing of hardware facilities but also is in the construction of a dynamically adjusted curriculum development mechanism: industry experts participate in the formulation of training programs, real enterprise projects are transformed into teaching cases, and industrial technology standards are embedded in curriculum standards, forming a closed - loop system of “demand - oriented - dynamic feedback - continuous improvement” [2].

Policy innovation at the institutional level has laid a solid foundation for the deep integration of industry and education. The “Excellence Engineer Education and

Training Plan 2.0” launched by the Ministry of Education requires that the practical credit ratio of engineering majors be not less than 35%, and promotes the establishment of collaborative education bases between 500 universities and leading enterprises in the industry [3]. This institutional design is reconstructing the education evaluation system, incorporating enterprise satisfaction, achievement conversion rate, etc. into the quality assessment indicators of universities.

The digital transformation has opened up a new perspective for industry-education integration. The application of virtual simulation laboratories and digital twin technology platforms enables students to complete the design and debugging of complex engineering systems in a virtual environment. The “Intelligent Manufacturing Cloud Classroom” jointly built by industrial Internet platforms and universities realizes the real - time interaction between the teaching process and production data [4]. This teaching scenario that combines virtual and real not only improves students’ digital capabilities but also cultivates “digital craftsmen” adaptable to intelligent manufacturing.

2.2. Construction of a Comprehensive Cultivation System

The comprehensive cultivation system includes aspects such as the curriculum system, practice platforms, and competition carriers. By improving the curriculum structure, strengthening the practical links, and actively guiding students to participate in diverse competitions, it can significantly enhance students’ comprehensive qualities and innovation potential. The construction of a comprehensive cultivation system requires the formation of a collaborative mechanism of “curriculum - based foundation - practice - empowered - competition - tempered”. Through the progressive path of knowledge structuring, ability contextualization, and quality manifestation, it systematically cultivates compound talents adapted to the digital economy era. Specifically:

Modular Curriculum System:

Courses are restructured into interdisciplinary modules. The reconstructed system will be carefully divided into modules. For example, based on different knowledge fields like financial technology and innovation theory, and different skill levels from basic to advanced, modules such as insights into the frontiers of finance and economic technology, innovation thinking training, and entrepreneurial practice simulation are set up. For example, modules such as insights into the frontiers of finance and economic technology, innovation thinking training, and entrepreneurial practice simulation are set up. Each module is both independent and interrelated, enabling students to comprehensively improve their innovation and entrepreneurship capabilities from theoretical foundation, thinking inspiration, to practical experience, and continuously supply high - quality talents with solid qualities and innovative vitality to the field of FinTech integration. Examples include the technology - business double - helix curriculum framework of Tsinghua University, the dynamic knowledge graph update mechanism of Shanghai Jiao Tong University, and the micro - certification system construction of the Central University of Finance and Economics [5] .

Virtual-Real Integrated Practice Platform:

The blended virtual-physical practice platform effectively integrates diversified experimental teaching resources to construct an innovative talent cultivation system. Characterized by technological sophistication, functional integration,

resource optimization, open sharing, and operational efficiency, this platform establishes a hybrid experimental teaching environment that provides students with highly realistic virtual simulation scenarios to support autonomous learning and innovative practice.

By promoting deep integration between information technology and academic disciplines, the platform enhances the digital transformation of experimental teaching resources, management systems, and support services. It actively explores innovative applications of information technology in experimental pedagogy, thereby driving reforms in teaching methodologies and modes.

Furthermore, the platform emphasizes tight integration between teaching and research, incorporating scientific research concepts, culture, outcomes, and methodologies into experimental instruction to holistically enhance students' scientific inquiry and technological innovation capabilities. Simultaneously, by establishing university-enterprise collaborative training mechanisms, it fully leverages corporate R&D strengths and technical service advantages to foster deep convergence between specialized experiments and scientific research, engineering practice, and social applications. This provides students with more authentic, practice-oriented learning opportunities.

Tiered Competition System:

Competitions are structured hierarchically. First, at the basic tier, a basic skills competition level can be set up, such as innovation and entrepreneurship knowledge competitions or case analysis competitions, to help students master basic theories and methods. Second, at the intermediate tier, simulated entrepreneurship competitions can be introduced, such as business plan writing and virtual enterprise operation, to improve students' practical abilities. Finally, at the advanced tier, a real - world entrepreneurship testing level can be set up, connecting with the real market, organizing entrepreneurship project roadshows or incubator docking activities, and encouraging students to transform their ideas into actual projects. Through the tiered competition system, students can gradually improve their innovation and entrepreneurship abilities at different tiers, forming a complete cultivation chain from theory to practice, from simulation to actual combat, and supplying diversified talents with innovative thinking and entrepreneurial qualities to the field of finance and economic technology.

Competency Assessment System:

In FinTech talent cultivation, the innovation and entrepreneurship education competency assessment system plays a pivotal role. This system breaks through the limitations of traditional one-dimensional evaluation by adopting multi-dimensional dynamic metrics. It not only examines students' mastery of theoretical knowledge in financial economics and technology applications, but more importantly evaluates their performance in innovative thinking and entrepreneurial practice.

The system employs a comprehensive tracking mechanism that collects multidimensional data including classroom performance, project assignments, competition achievements, and internship feedback. By establishing corporate evaluation feedback mechanisms and block chain-based learning outcome certification, it precisely captures students' competency evolution across different stages.

These evidence-based insights enable personalized growth recommendations for students while providing educators with data-driven strategies for pedagogical optimization. This ensures steady competency enhancement for FinTech talents nurtured through innovation and entrepreneurship education, better preparing them to meet future challenges.

3. Cultivation Model Based on the “One Core and Five Dimensions” Concept

3.1. Model Framework

“One Core Focus” refers to establishing an elite FinTech innovation talent cultivation model that serves national strategic needs, structured around five foundational pillars: curriculum as the basis, research as the guide, practice as the driver, competitions as the platform, and innovation as the ultimate goal.

In the current global landscape, competition in high-tech fields has intensified. Against this backdrop, China’s education system remains firmly rooted in its fundamental mission of “fostering virtue through education, cultivating talent for the Party and the nation.” This approach prioritizes developing students’ innovation and entrepreneurship capabilities to meet pressing national demands.

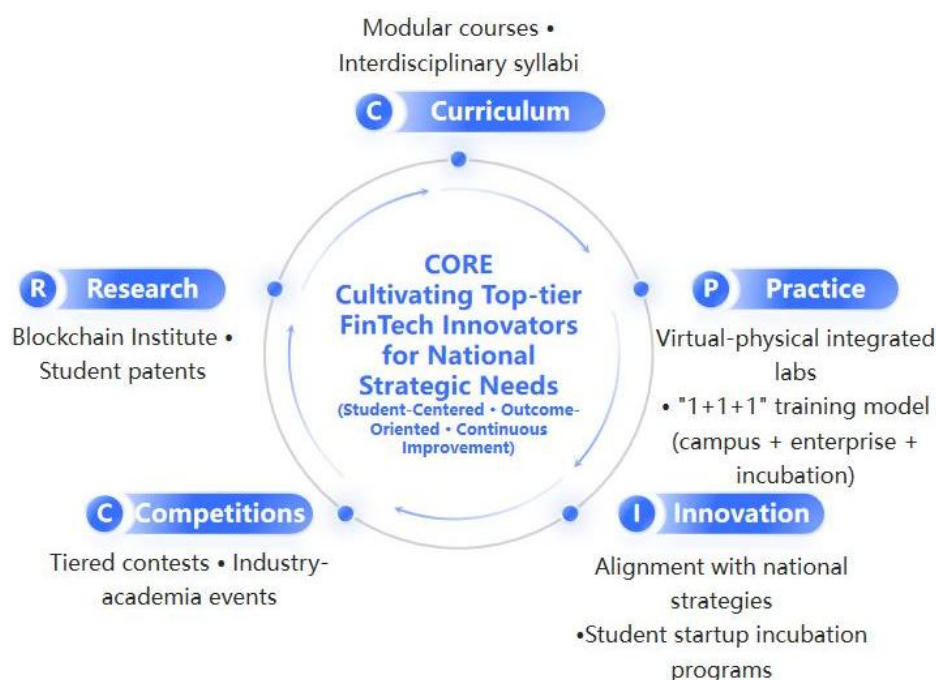


Figure 1. One Core and Five Dimensions.

3.2. Specific Implementation Measures

The strategic vision is operationalized through the model’s five dimensions.

Courses as the foundation:

The innovation and entrepreneurship education for FinTech talents involves interdisciplinary, cutting-edge curricula spanning computer science, information security, economics, law and other fields. Traditional education overemphasized theoretical knowledge while neglecting the cultivation of students' hands-on capabilities and innovation potential. Nowadays, in order to stimulate students to

deeply study the core knowledge of innovation and entrepreneurship education and understand the frontiers of interdisciplinary fields, relevant courses are actively offered, and teaching plans matching the courses are developed, forming a modular knowledge system for innovation and entrepreneurship courses that integrates "basic knowledge - platform overview - technical practice - application exploration".

Scientific research as the forerunner:

Promote research through teaching and advance teaching through research, facilitating the deep integration of research and teaching to achieve synergistic progress and mutual empowerment. With research as the guiding force, stimulate students' vitality for innovation and inquiry. For example, since 2015, the School of Information at Z University has actively organized various academic seminars on financial technology and hosted multiple academic forums and faculty training programs in this field. In 2020, the university established the Block Chain Technology and Application Research Institute. Within this research-rich environment, students interested in FinTech security are guided to explore actively in extracurricular activities, igniting their passion for research and innovation.

Practice as the starting point:

Practical teaching aims to apply theoretical knowledge to real-world scenarios, enhancing students' hands-on abilities to meet the needs of the university's first-class undergraduate program development and the advancement of New Engineering Education. To ensure all students engage in engineering practice, a task-driven practical teaching method is adopted. This approach follows a structured process: Task Assignment-Preparation-Execution-Problem-Solving-Evaluation.

Competitions as the carrier:

Taking competitions as the platform and focusing on events such as the China "Internet Plus" College Student Innovation and Entrepreneurship Competition, the National College Student E-commerce "Innovation, Creativity, and Entrepreneurship" Challenge, the "Challenge Cup" National College Student Extracurricular Academic Science and Technology Works Competition, and the National College Student Information Security Competition, professional mentors will be arranged to provide full-process guidance, strengthening comprehensive support and coaching for competition activities.

Innovation as the goal:

Aimed at fostering innovation, we enhance students' comprehensive capabilities in FinTech-driven creativity. The financial sector represents one of the most extensive and profound arenas for technological application. In specialized domains such as supply chain finance, trade financing, payment settlement, and capital management, technology adoption has progressively advanced with notable achievements. As finance is a traditional strength of our university, we have established a FinTech and applied curriculum system to: Offer interdisciplinary electives for finance majors, cultivating their ability to leverage innovative technological thinking and tools in FinTech innovation; Integrate FinTech applications into engineering disciplines (e.g., computer science), equipping students with skills to tackle intelligent financial challenges.

4. Case Study: Practices of Z University's School of Information

4.1. Curriculum and Faculty Development

Leveraging the university's multidisciplinary strengths, the School vigorously promotes cross-disciplinary collaboration, guided by its "one core and five dimensions" FinTech-oriented strategy, to develop first-class undergraduate programs. In research, the School prioritizes original innovation and deep disciplinary convergence, addressing cutting-edge academic challenges and national economic needs. It has achieved groundbreaking results in block chain technology, cyber security, and other fields, significantly elevating its global impact. To date, the School boasts 4 national-level first-class undergraduate programs and 1 Beijing municipal-level first-class undergraduate program.

The School emphasizes experimental and practical teaching, fostering students' ability to bridge theory and practice. A diversified practical training system encourages students to engage in academic seminars with research mentors starting from their sophomore year. Through national and provincial-level projects, students gain hands-on research and engineering experience, leading to peer-reviewed publications and patents. Additionally, the School nurtures well-rounded talent by actively guiding students to participate in innovation/entrepreneurship projects and professional competitions, unlocking their potential in FinTech research.

Faculty development—spanning foundational and applied disciplines—is a cornerstone of the School's first-class program initiative. It brings together FinTech experts, cultivates outstanding educators, and publishes pioneering textbooks. The School has successfully established an interdisciplinary FinTech-information security program and earned accolades including:

The School has a national bilingual teaching demonstration course, "Software Development Tools". "E - commerce Security", "Principles and Research Methods of Information Systems", and "Principles and Applications of Databases" have been rated as high - quality textbooks in Beijing higher education. College teachers have won 2 Beijing teaching achievement awards. "Introduction to E - commerce" has been rated as a national first - class online - offline integrated course. "Fundamentals of Information Technology" and "Principles and Applications of Big Data Analysis" have been rated as high - quality undergraduate teaching materials and courseware in Beijing universities.

4.2. Analysis of Student Innovation and Entrepreneurship Achievements and Award Results

After analyzing the data of innovation and entrepreneurship achievements and award - winning results of about 500 students from the classes of 2018, 2019, and 2020 in the college, remarkable results have been obtained. In various innovation and entrepreneurship projects, approximately 20% of the students successfully obtained project approvals. Notably, the class of 2020 stood out with a project approval rate of 25%. Among students participated in computer - related and Internet finance - related competitions, the proportion of award - winning students reached 35%. The students of the class of 2018 won 2 first - prizes and 5 second - prizes in the National College Students' E - commerce "Innovation, Creativity, and Entrepreneurship" Challenge. The students of the class of 2020 won 2 national - level awards and more than 10 provincial - level awards in competitions such as the China "Internet Plus"

College Students' Innovation and Entrepreneurship Competition, the “Blue Bridge Cup” National Software and Information Technology Professional Talent Competition, and the National Cryptography Technology Competition. These data fully demonstrate that, with the cultivation of comprehensive qualities as a characteristic, the college actively guides students to participate in various innovation and entrepreneurship projects and professional competitions, effectively tapping the students' scientific research potential in the field of finance, economics, and technology. Figure 2 shows the category distribution of students' awards and achievements.

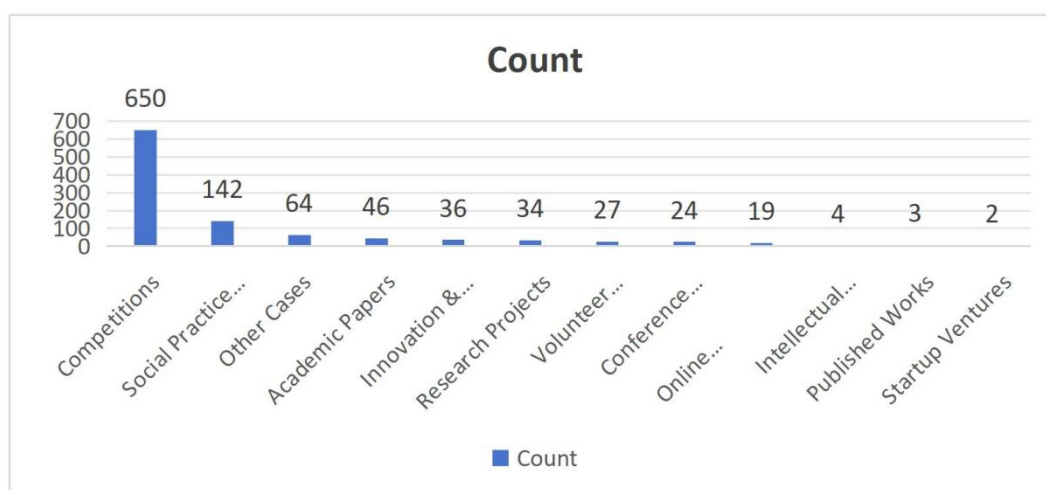


Figure 2. Distribution of Student Awards and Achievements by Category.

The data on award categories reveals that competition-related achievements dominate significantly in quantity, far surpassing other categories. This indicates: among the student group, the participation rate in competition activities is high, and the organization and incentive mechanisms for competitions are relatively complete, prompting everyone to actively engage in competitions and achieve results. However, the number of award - winning achievements in categories such as self - employment, publications, and intellectual property rights is relatively small, suggesting that there are certain development bottlenecks in these areas. For example, starting a business is difficult, and creating publications and applying for intellectual property rights require more resources and time. (Figure 3)

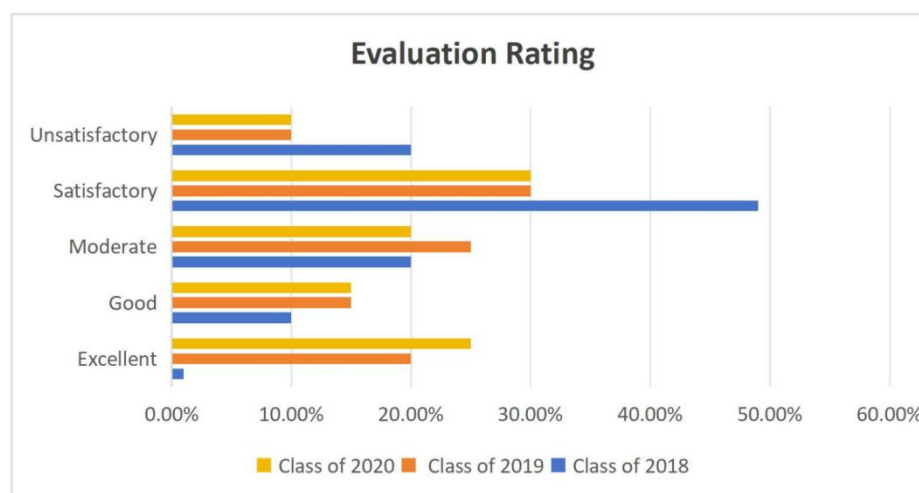


Figure 3. Evaluation Results of Students' Innovation and Entrepreneurship Performance.

Overall, looking at the students' innovation and entrepreneurship evaluation scores in Figure 3, the performance of students in the class of 2019 and 2020 is significantly better than that of the class of 2018. In particular, the substantial increase in the proportion of excellent students and the decrease in the proportion of unqualified students indicate that the overall level of students is improving year by year.

5. Conclusions

The exploration and practice of cultivating innovative and entrepreneurial talents in financial technology is a long-term and complex process. By clarifying key elements, constructing training models, drawing on successful cases, and analyzing existing challenges, we can continuously improve the financial technology talent innovation-entrepreneurship education system. This includes deepening the exploration of AI-enabled educational scenarios, further enhancing talent cultivation quality, and providing robust support for the high-quality development of innovation and entrepreneurship education.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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