

THE TALENT-CULTIVATION MODEL FOR FINANCE AND ECONOMICS PROGRAMS IN VOCATIONAL UNDERGRADUATE EDUCATION FROM A BIG DATA PERSPECTIVE

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Abstract: The widespread adoption of big data technologies has fundamentally reshaped the operational model of the modern finance and economics sector. It has driven a shift in financial work from traditional accounting toward data analysis and intelligent decision-making, while placing new demands on practitioners' overall competence and professional capabilities. As a core form of higher-level vocational education, vocational undergraduate education focuses on preparing applied and technically oriented professionals and serves as a major source of finance and economics talent for industry. At present, amid the rapid development of the digital economy and the big data industry, the conventional talent-cultivation model used by vocational undergraduate finance and economics programs remains rigid and is clearly misaligned with the practical requirements and competency standards of industry roles. Against this background, this paper considers developments in the big data industry alongside the distinctive characteristics of vocational undergraduate education, analyzes current problems in the cultivation of finance and economics professionals, and proposes targeted reform strategies. It aims to improve the education system for vocational undergraduate finance and economics programs, prepare high-quality technical and skilled finance and economics professionals for the industry's digital transformation, and provide practical guidance for teaching reform in these programs.

Keywords: Big data; Vocational undergraduate education; Finance and economics programs; Talent cultivation; Industry–education integration

1 INTRODUCTION

Vocational undergraduate education is an important component of China's modern vocational education system. Unlike general undergraduate education, which is oriented toward cultivating academically trained professionals, its primary objective is to prepare high-level technical and skilled professionals who meet the needs of industrial development and specific job roles, thereby supporting the high-quality development of the real economy and modern service industries [1]. For many years, most vocational undergraduate institutions have continued to use traditional teaching models in their finance and economics programs. The separation of theoretical from practical instruction and the disconnect between classroom teaching and industry positions mean that students acquire a solid foundation in theoretical knowledge but remain weak in such practical capabilities as data processing, intelligent-finance operations, and data-informed analysis and decision-making. Consequently, they struggle to meet employers' requirements for finance and economics roles in the digital era.

As vocational education reform has continued to deepen, the integration of industry, education, and research and university–enterprise collaboration have become central approaches to talent cultivation in vocational undergraduate education. These approaches have helped address the traditional overemphasis on theory at the expense of practice and have provided strong support for building a finance and economics talent-cultivation system that integrates theory and practice. In actual institutional practice, however, university–enterprise collaboration at most institutions remains superficial and has yet to align closely with changes in job roles, technological advances, and competency requirements in the finance and economics sector in the context of big data. In response to these new industry developments and job requirements, vocational undergraduate institutions urgently need to restructure their curricula, innovate teaching models, and optimize assessment mechanisms. These reforms should bridge the gap between campus-based instruction and enterprise practice, establish a comprehensive and multidimensional talent-cultivation system for finance and economics programs, and ensure that educational outcomes closely match industry needs.

2 TRANSFORMATIVE IMPACT OF BIG DATA TECHNOLOGIES ON THE FINANCE AND ECONOMICS SECTOR AND OCCUPATIONAL COMPETENCY REQUIREMENTS

China's finance and economics sector has undergone three successive stages: manual bookkeeping, computerized accounting, and financial informatization. Driven by digital technologies such as big data, artificial intelligence, and

cloud computing, it has now entered a new stage of intelligent and digital transformation, bringing fundamental changes to industry operating models, job content, and professional competency standards [2]. Findings from an industry survey published by the Shanghai Accounting Society in 2021 indicate that ten digital technologies—including financial cloud platforms, electronic invoicing, financial big data analytics, intelligent financial robots, next-generation ERP, and data mining—have become the core set of technologies reshaping accounting, finance, auditing, and other finance and economics roles. Together, these technologies are modernizing corporate financial accounting, financial management, and financial decision-making.

Importantly, the core value of intelligent big data technologies for the finance and economics sector lies in augmenting professional capabilities rather than replacing jobs. During the computerized accounting stage, finance professionals focused on repetitive, basic accounting tasks such as bookkeeping, account reconciliation, closing the books, and voucher entry, which consumed substantial time and labor. Following the implementation of big-data-driven intelligent finance systems, standardized, low-value-added financial work can be automated and handled in batches, while enterprises are gradually establishing integrated financial data centers. This transformation frees finance professionals from cumbersome basic accounting work and shifts their focus toward higher-value responsibilities, including financial data analysis, risk prevention and control, budgetary control, and strategic decision-making. The core capability profile has accordingly shifted from “accounting and bookkeeping” to “analysis, judgment, and decision-making.”

The digital transformation of the sector is compelling vocational undergraduate finance and economics programs to upgrade their talent-cultivation models. In the context of digital transformation, corporate financial work entails processing massive volumes of internal and external data, both structured and unstructured, placing greater demands on finance professionals’ data literacy. These professionals urgently need integrated capabilities in data collection, screening, mining, analysis, and practical application so that their analyses can provide a sound basis for corporate decision-making, risk control, and improvements in quality and efficiency [3]. Meanwhile, finance and economics programs have long remained among the most popular fields in higher education, and finance and economics graduates reportedly account for more than 10%. As large numbers of graduates enter finance, accounting, and taxation-related fields, competition within the labor market is intensifying. In this context, the traditional talent-cultivation model, which focuses primarily on theoretical instruction and basic accounting skills, can no longer meet the demands arising from industry transformation and labor-market competition. Reforming the teaching of vocational undergraduate finance and economics programs has therefore become an urgent priority [4].

3 EXISTING PROBLEMS IN CULTIVATING VOCATIONAL UNDERGRADUATE FINANCE AND ECONOMICS PROFESSIONALS IN THE CONTEXT OF BIG DATA

3.1 An Outdated Course Assessment System That Prioritizes Outcomes over Learning Processes and Theory over Competence

Course assessment is crucial for evaluating teaching effectiveness, gauging students’ professional competence, and improving instructional quality. A sound assessment system should encompass theoretical foundations, hands-on skills, innovative thinking, and overall competence. At present, most vocational undergraduate finance and economics programs continue to rely on traditional end-of-semester summative assessment. Assessment formats remain rigid and limited, while the dimensions of evaluation are too narrow to provide a comprehensive measure of students’ overall professional competence. Most course assessments take the form of final written examinations and focus on students’ recall of theoretical concepts from textbooks. Instructors typically specify the key material to be examined and direct students to memorize it in preparation for the test. This approach fosters an examination-oriented mindset: most students aim merely to pass the course and passively memorize discrete knowledge points for the examination, without systematically organizing, deeply understanding, or flexibly applying what they have learned.

Even when institutions offer practice-oriented courses such as practical financial operations and financial big data training, the corresponding practical assessments often consist of standardized, fixed-format tasks. Students can receive credit simply by following prescribed procedures, with little exposure to open-ended, innovative, or scenario-based assessment. Once a workplace scenario or a data parameter changes, they struggle to respond flexibly. Consequently, students’ theoretical knowledge becomes seriously disconnected from workplace practice; their core professional competence, ability to apply data, and problem-solving skills are not developed effectively; and assessment results fail to reflect their actual job readiness.

3.2 Rigid, Monolithic Teaching Approaches and Poor Articulation Between University- and Enterprise-Based Instruction

Within a university–enterprise collaborative education system, vocational undergraduate students have the dual status of campus learners and prospective employees. Campus-based theoretical instruction must therefore be effectively linked with enterprise-based practical training to create an integrated system in which universities and enterprises coordinate their contributions, reinforce one another’s strengths, and integrate theory with practice. In actual teaching, however, university and enterprise instruction remains insufficiently integrated and poorly articulated, substantially diminishing learning outcomes. In campus classrooms, most instructors still rely on didactic, teacher-centered instruction focused on transmitting theoretical knowledge. They touch only briefly on hands-on applications of financial big data, emerging

industry technologies, and job-specific operational techniques. Classes consequently offer little engagement and fail to stimulate students' independent thinking or enthusiasm for practice.

Enterprise training mentors, by contrast, tend toward the opposite extreme: they place excessive emphasis on explaining operational procedures while neglecting the underlying financial theory, data logic, and industry standards. When students undertake practical training without adequate theoretical grounding, they can do little more than mechanically imitate operating procedures. They neither understand the principles underlying those procedures nor transfer what they have learned to solve complex workplace problems. The underlying cause is the absence of a routine mechanism for instructional communication between universities and enterprises. The two sides have not jointly planned teaching content in light of job requirements in the big data era or established an appropriate balance between theoretical and practical instruction. Students therefore struggle to adapt as they move between campus study and enterprise training, leaving knowledge acquisition fragmented and competency development unsystematic.

4 REFORM STRATEGIES FOR TALENT CULTIVATION IN VOCATIONAL UNDERGRADUATE FINANCE AND ECONOMICS PROGRAMS IN THE CONTEXT OF BIG DATA

4.1 Align the Curriculum with Job Requirements and Reconstruct a Tiered, Progressive Curriculum System

The central orientation of vocational undergraduate talent cultivation is to enhance employability and develop the capabilities required for specific job roles. Curriculum design must therefore closely reflect the evolving competency standards for finance and economics positions in the big data era. Institutions should strengthen substantive university–enterprise collaboration by working with leading companies in the sector, digital-finance solution providers, and financial institutions to analyze job roles and identify the core competency requirements for positions in financial big data analysis, intelligent accounting, and financial and tax data analysis. In conjunction with students' patterns of career development, they should then establish a tiered and progressive curriculum system comprising vocational foundations, core competencies, and specialized extensions.

In accordance with the requirements of the national catalog for vocational education programs, existing curriculum resources should be consolidated and optimized, and academic degree education should be closely aligned with vocational skill-level certification. Assessment content for vocational certificates in intelligent finance, big data analytics, cloud-based financial applications, and digital finance and taxation should be integrated into routine teaching, thereby achieving curriculum–certificate integration and alignment between curricula and job roles [5]. Foundational vocational courses should be offered uniformly to give students a solid grounding in finance and economics. In response to the differentiated requirements of finance and economics roles in the era of big data, the core-competency module should provide differentiated and targeted course offerings. Priority should be given to courses in financial big data analytics, intelligent-finance operations, and enterprise data risk management, thereby aligning the curriculum with industry competency standards for digital job roles. Elective extension modules should address students' individualized development needs and cover areas such as financial data analytics, business decision-making, and digital finance and taxation planning. Together, these offerings should meet demand for professionals at different levels and in diverse job roles, while cultivating finance and economics professionals who possess both a sound theoretical foundation and practical digital skills.

4.2 Reform Teaching Approaches to Enable Targeted, Inquiry-Based Instruction

Meeting the educational needs of the finance and economics sector in the context of big data requires moving beyond rigid conventional teaching models. Pedagogical concepts, teaching methods, and instructional priorities must all be updated to create a new teaching system suited to cultivating digitally capable professionals.

First, teachers' roles should be redefined. Rather than serving solely as transmitters of knowledge, teachers should become organizers of instruction, integrators of resources, and facilitators of learning. Using a range of methods—including case-based teaching, scenario simulation, project-based learning, and action learning—teachers should incorporate authentic corporate cases involving financial big data and hands-on, job-related projects into instruction. Students can thus be guided toward active inquiry and deeper reflection, with particular emphasis on developing higher-order competencies in data interpretation and judgment, business analysis, and risk identification, thereby overcoming the limitations of conventional passive learning.

Second, targeted and personalized instruction should be implemented. Online teaching platforms and big-data-enabled learning analytics tools can be used to identify each student's knowledge gaps, weaknesses in hands-on practice, and learning characteristics, replacing the conventional one-size-fits-all model of instruction. Tiered instruction and teaching in small classes should be provided in response to students' individual learning needs. Teaching should focus particularly on key and difficult aspects of data analytics and the practical operation of intelligent-finance systems that students may struggle to master independently. In this way, classroom instruction can concentrate on developing core competencies and accommodate students' differentiated and individualized career-development needs.

Finally, the instructional focus should shift from “knowledge acquisition” to “inquiry and application.” Conventional finance and economics education emphasizes mastery of accounting standards and accounting methods, with a primary focus on the standardized application of knowledge. In the era of big data, instruction should instead center on data mining, data analytics, and the application of data to decision-making. Students should be guided to draw on disciplinary knowledge to process structured and unstructured financial and economic data and to use data analytics to

solve practical problems in business operations, financial management, and risk prevention and control. This approach can strengthen their practical application skills and capacity for innovative inquiry [6].

4.3 Optimize Assessment Mechanisms and Establish a Whole-Process Formative Assessment System

To address the limitations of conventional, single-mode assessment, vocational undergraduate finance and economics programs should remain closely aligned with their mandate to cultivate application-oriented professionals. They should establish a diversified assessment system centered on formative assessment and supplemented by an evaluation of students' overall competence. The weight assigned to end-of-term summative assessment should be appropriately reduced, while greater emphasis should be placed on the professional, practical, and application-oriented dimensions of evaluation. Assessment can thereby promote learning, while evaluation contributes to competence development. Course teams should formulate detailed formative-assessment rules for each course in accordance with program-level talent-cultivation objectives, specifying assessment methods, content, and scoring criteria to ensure that procedures are open and transparent and that results are objective and fair [7].

Assessment content should cover multiple dimensions, including students' attitudes toward learning, classroom performance, routine assignments, practical training and hands-on work, case analysis, and project work, replacing reliance on a single theoretical written examination. Multiple evaluators should also be involved through an integrated, three-part mechanism comprising student self-assessment, group peer assessment, and instructor assessment. This mechanism should evaluate students' knowledge, practical application skills, and teamwork competence from multiple perspectives, making the results more objective, comprehensive, and accurate. Continuous, multidimensional assessment can help students move beyond an examination-oriented approach to learning, encourage them to value sustained engagement in their daily studies, and motivate them to improve their practical digital skills and overall professional competence. The learning process can thus be closely aligned with the educational objectives of the program.

4.4 Innovate the Evaluation System and Establish a Joint University–Enterprise Evaluation Mechanism

Under a university–enterprise collaborative education model, an institution-only evaluation system cannot fully assess students' job readiness. A joint university–enterprise evaluation system is therefore needed to align student assessment with workplace standards. Institutions should establish regular communication mechanisms with partner enterprises and jointly develop comprehensive student-evaluation plans based on enterprise performance standards and the requirements of digital finance roles. These plans should cover theoretical knowledge, practical skills, professional competence and conduct, and job readiness.

Theoretical learning should be evaluated through a comprehensive approach that combines “ongoing formative assessment and an end-of-term summative written examination.” Each week, teachers should systematically review students' classroom performance and compile cumulative formative-assessment data for each stage of learning. Students' theoretical learning outcomes should then be evaluated by combining these data with their final written-examination scores. The evaluation of practical competence should center on students' performance in enterprise-based practical training. Enterprise mentors should document students' performance in practical operations, problem-solving abilities, and adaptation to job roles throughout the training period, and assess these dimensions in conjunction with the outcomes of an end-of-term comprehensive practical project. Integrating formative with summative assessment and institution-based with enterprise-based evaluation can accurately reflect students' actual professional proficiency and job readiness. It can also provide stronger incentives for students to adopt a conscientious approach to learning and proactively strengthen their practical capabilities, thereby improving the quality of talent cultivation through university–enterprise collaboration.

4.5 Integrate Internal and External Resources to Deepen University–Enterprise Collaboration

High-quality teaching resources provide essential support for cultivating digitally capable finance and economics professionals. Institutions should integrate on-campus practical training resources, online digital resources, and enterprise workplace resources to improve teaching content and instructional approaches and strengthen students' digital capabilities. On the one hand, institutions should draw on the “Internet Plus Education” model to integrate online teaching resources for financial big data, industry practice cases, and digital practical training courses. These resources should be combined with on-campus facilities such as financial training centers, financial big data laboratories, and job-competency training rooms and made available to students at all times. This will provide a regular platform for hands-on training and build a solid foundation in data processing and intelligent-finance operations.

On the other hand, institutions should continue to deepen substantive university–enterprise collaboration by facilitating resource sharing and using the complementary strengths of both parties for mutual benefit. By drawing on enterprises' authentic workplace settings, extensive financial datasets, and cutting-edge industry technologies, institutions can provide students with immersive practical training and work-based internships. These opportunities expose students to practical work with financial big data, enterprise data analytics, financial and tax planning, and related tasks in authentic work settings, thereby strengthening their workplace competence [8]. Enterprises, in turn, can draw on institutional faculty and teaching resources and recruit high-quality graduates to strengthen their workforces, helping to address shortages of digitally capable finance professionals. This mutually beneficial model of university–enterprise

collaborative talent cultivation can create a virtuous ecosystem in which industry guides program development and programs support industrial development. It can thereby provide the finance and economics sector with a continuing supply of high-quality, versatile technical and skilled professionals who meet the needs of big-data-driven digital transformation.

5 CONCLUSION

The widespread adoption of big data technologies has driven the digital transformation of the finance and economics sector while imposing higher standards and new requirements on talent cultivation in vocational undergraduate finance and economics programs. Vocational undergraduate institutions must keep pace with industry trends, remain grounded in the educational mission of vocational education, and directly address current problems, including outdated curricula, rigid teaching models, inadequate assessment mechanisms, and insufficiently substantive university–enterprise integration. They should optimize the talent-cultivation model for finance and economics programs by developing job-aligned curricula, adopting targeted teaching models, improving whole-process assessment mechanisms, establishing joint university–enterprise evaluation systems, and integrating internal and external educational resources. These reforms should focus on strengthening students' capabilities in big data processing, financial analysis, hands-on job performance, and overall professional competence [9-11]. This approach will not only help students align closely with industry job requirements and broaden their career-development pathways but also raise both the quality of program provision and the programs' core competitiveness in talent cultivation. In doing so, it will establish a strong talent base and provide robust support for the digital transformation, upgrading, and high-quality development of the finance and economics sector.

COMPETING INTERESTS

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REFERENCES

- [1] Xiong Z F, Xue Y. Challenges and responses in cultivating new finance and economics talent in the age of artificial intelligence: A perspective based on the principles governing the internal and external relations of education. *Journal of Hebei University of Economics and Business (Comprehensive Edition)*, 2023, 23(3): 58-63.
- [2] Gu J. Innovation in talent-cultivation models based on blockchain applications: The case of higher vocational finance and economics programs in the Guangdong–Hong Kong–Macao Greater Bay Area. *Modern Business Trade Industry*, 2023, 44(17): 63-66.
- [3] Yan D B, Qin J X, Chen Y L. Exploration and practice of a new finance and economics talent-cultivation model at higher education institutions undergoing transformational development: The case of the economics program. *The Theory and Practice of Innovation and Entrepreneurship*, 2023, 6(14): 20-24, 57.
- [4] Liu H Y. Changing requirements for the professional competence of finance and economics talent in the Guangdong–Hong Kong–Macao Greater Bay Area and corresponding training strategies: The case of finance and economics talent in Guangxi. *Social Scientist*, 2023(5): 70-76.
- [5] Tang D P, Wang B L, Liu Y C. Reconstructing accounting education in the digital-intelligence era: Supply–demand tensions and element innovation. *Accounting Research*, 2020(12): 180-182.
- [6] Meng F, Chu L Q. Reflections on the development of financial management programs in the digital economy and intelligent era. *Financial Management Research*, 2021(1): 94-98.
- [7] Xu Y, Zhao L N. The value logic and pathways for strengthening teaching-innovation capacity among higher vocational teachers: From the perspective of integrated education through job roles, curricula, skills competitions, and vocational certificates. *Vocational Education Forum*, 2022, 38(10): 72-81.
- [8] Zhong F X, Wang L, Liu Y Y. Teaching reform for integrating job roles, curricula, skills competitions, and vocational certificates in higher vocational big data and accounting programs in the context of digital intelligence. *Journal of Hubei Open Vocational College*, 2026, 39(1): 75-77.
- [9] Lu H, Yang Y. Interdisciplinary curriculum reform and practice in accounting and finance programs oriented toward digital literacy and skills development: Based on action research theory. *The Theory and Practice of Innovation and Entrepreneurship*, 2025, 8(13): 31-34.
- [10] Sledgianowski D, Gomaa M, Tan C. Toward integration of Big Data, technology and information systems competencies into the accounting curriculum. *Journal of Accounting Education*, 2017, 38: 81-93. DOI: 10.1016/j.jaccedu.2016.12.008.
- [11] Dzurain A C, Jones J R, Olvera R M. Infusing data analytics into the accounting curriculum: A framework and insights from faculty. *Journal of Accounting Education*, 2018, 43: 24-39. DOI: 10.1016/j.jaccedu.2018.03.004.