

# Research and Practice on the Reform of “Financial Big Data Analysis” in the Context of New-Quality Productivity

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**Abstract:** In response to the growing integration of new-quality productivity and the digital transformation of financial services, this study explores the reform and practice of the “Financial Big Data Analysis” course. The research aims to address the mismatch between current curriculum design and the competency demands of intelligent business. Based on the key stages of financial data analysis (data collection, cleaning, modeling, visualization, and decision-making), the study proposes a framework of “Theory, Tools, Scenario, and Decision” to guide curriculum development. To implement the framework, the course integrates project-based learning, cross-disciplinary teaching teams, and school-enterprise collaboration, aiming to cultivate students’ financial thinking, technical proficiency, and cross-functional and inter-organizational communication skills and innovative thinking. Feedback showed significant improvements in students’ core competencies. Real business case tasks improved their decision-making capabilities and industry responsiveness. The results demonstrate the effectiveness of the reform in cultivating interdisciplinary talents who meet the real-world needs of the digital economy and contribute to the ecosystem of new-quality productivity in higher education.

**Keywords:** New-Quality Productivity; Financial Big Data Analysis; Course Reform; Talent Development; Data Literacy

## 1. Introduction

With the deep integration of the information technology of the new generation and the real economy, new-quality productivity based on data elements is remodeling the world’s industrial structure and business ecosystem [1]. The distinctive feature of new quality productive forces lies in innovation. Among them, deepening the innovation of talent development mechanisms requires fostering a virtuous cycle among education, science and technology, and talents. Under this context, the fundamental functions of financial

management are transformed from conventional bookkeeping and report preparation to value extraction, risk forecasting, and strategic decision support relying on big data [2]. Meanwhile, existing university courses on Financial Big Data Analysis cover many challenges, such as outdated teaching materials that fail to keep pace with technological developments, discrepancies between pedagogical models and the needs of the enterprise, and weak data analytics thoughtfulness and practical skills among students [3]. These challenges have created an enormous gap between the cultivation of financial talent and the need for intelligent transformation in the digital economy era. Therefore, how to reconstruct the curriculum system and change the teaching model to cultivate interdisciplinary talents with strong financial capabilities complemented by the application of big data has become an urgent issue in higher education reform.

This paper is grounded in the restructuring rationale of the competency model of financial professionals under new-quality productivity, and the reform paths and practical results of the “Financial Big Data Analysis” course are emphasized. Based on the technical demands of the entire process, including data collection, cleaning, modelling, and visualization, of intelligent financial scenarios, and the integration of the latest applications of tools like Python, Tableau, and machine learning in financial analysis, the paper puts forward a “Theory, Tools, Scenario, and Decision” four-dimensional integrated course framework [4]. It further studies innovative mechanisms like project-oriented teaching, school-enterprise cooperative case libraries, and cross-professional teaching teams, to address the disconnection between technical tools and the business logic of traditional courses. The results can give theoretical suggestions to the digitization of accounting and finance-related courses, and supply enterprises with practical

talent possessing data thinking and operative skills, thus promoting the creation and enhancement of the new-quality productivity ecosystem.

## 2. Current Course Limitations

### 2.1 Weak Data Analysis Foundations and Insufficient Underlying Capability

Our findings from a field survey of this research in 2024 suggest that, though students possess an understanding of elementary theories of financial big data, 28.57% of students still lack strong foundational data analysis skills (e.g., statistical methods, and data cleaning). A study also reveals that accounting and finance students often face challenges in data model construction, such as ensuring accuracy in data relationships, avoiding redundant data, and presenting effective visualizations [5]. This prevents them from establishing strong analysis frameworks in real-world business settings. Some students are not equipped with a strong foundation of prerequisite courses, such as Python coding, which creates a disjoint between advancing to more sophisticated material and indicates deeper systemic gaps in foundational skill-building.

### 2.2 Lacking Analytical Design Skills and Ineffective Business Logic Conversion

Our assessment also indicates that 19.05% of students lack strong analysis design capabilities. They find it difficult to convert financial principles into data mining objectives and fail to design multi-dimensional indicators. In the digital economy era, accounting professionals are expected to possess the ability to integrate accounting logic with data science [6]; however, some students fall short of meeting this standard. An example is that, in financial risk warning model-related tasks, students routinely and blindly utilize algorithm libraries, failing to adjust their analyses to the characteristics of the industry, which emphasizes the widening gap between technical tools and business logic.

### 2.3 Lack of Communication Skills and Low Collaborative Decision-Making Ability

In group assignments, 19.05% of the students fail to meet the job specifications of communication and expression. Problems

involve interrupted presentations of results of financial analysis along with disrupted logical sequences in visual reports. To illustrate, some students may be able to utilize Power BI to produce dashboards but fail to convey the business implications behind the data through systematic expression, thus making the analysis useless for decisions.

### 2.4 Lacking Innovation Skills and Failing to Keep up with Industry Trends

Our survey also revealed that 19.05% of students exhibited significant deficiencies in their ability to innovate, particularly in scenarios involving cross-industry data analysis and the application of emerging technologies such as generative AI in finance. Many demonstrated a strong reliance on conventional approaches and rigid thinking patterns. For example, when dealing with multi-source heterogeneous data, students often defaulted to traditional analytical methods and lacked the initiative to explore new technologies for solving complex business problems. This issue is largely rooted in the lagging integration of technological advancements within traditional accounting education [7].

## 3. Course Reform Objectives

For resolving issues of weak foundations in data analysis and the gap between tools and actual business situations, the course employs the “1+X” BRICS Skills Competition standard and the Big Data Financial Analysis Vocational Certificate as reference points to design a tiered skill model. Studies suggest updating course objectives with the OBE (Outcome-Based Education) concept, emphasizing a focus on students’ final outcomes, and employing backward design for teaching activities. This is achieved by setting clear, challenging execution standards and strengthening the alignment between objectives and job market requirements [8]. Supplemental modules such as the use of Python to cleanse data are created to cover the 28.57% of students facing weak foundations. To counteract technological discontinuity, the course employs actual financial situations and tools such as Power BI dashboards to take the students through project-related training spanning the whole process starting from data collection, then modeling, then visualizations,

followed by the last step of decisions. This allows 80% of the students to shift technical skills to sophisticated business situations, corresponding exactly to intelligent finance job specifications.

To enhance innovation capabilities and communication skills, the course establishes a high-level development mechanism. On one aspect, through the incorporation of BRICS competition tasks into teamwork projects (e.g., financial report presentations, visual storytelling), students are forced to deliver business insights through “data storytelling” (e.g., ESG performance visualization), promoting “learning through evaluation”. This enhances logical reasoning, expression, and collaboration, enhancing the communication skill of the 19.05% low-performing group by 30%. Studies have shown that student-centered teaching approaches, such as group collaboration and case-based discussions that emphasize active student participation, are effective in enhancing students’ communication, teamwork, and innovation abilities [9]. On the other aspect, through the integration of case studies involving technologies such as generative AI and initiating cross-domain innovation challenges, the course fosters “ethical and intelligent” financial professionals with innovative capabilities and social responsibility, resolving the composite competency demands of the digital economy era.

In order to respond to the lagging response of students to the demands of the industry and the ineffective transformation of business logic, the course focuses on integrating finance and business, rebuilding the dual empowerment model of finance and business. On the basis of four actual enterprise scenarios, students are led to combine business information and macro-industry information, establishing analysis streams like “business drivers-financial indicators-managerial decisions” to empower 75% of the students to execute integrated business-finance analysis reports independently. Moreover, the course proposes typical industry scenarios like manufacturing cost driver analysis and inventory turnover improvement in retail, along with generative AI technology, to enhance students’ capabilities to transform data mining to business value, promoting competitive talent that is not only skilled at finance but has

knowledge in business, facilitating the practice of enterprise digital finance policy.

#### 4. Specific Course Reform Content

##### 4.1 Emphasis on Competency Development, Establish a “Student-centered” Ideological-Political Education System to Develop Comprehensive Qualities

By aligning with socialist principles and job-oriented business analysis capabilities, the course cultivates six principal teaching tasks. It integrates common professional norms of accountancy and financial professionals and sharpens ideological-political aspects. With the thread of “Clarity, Reflection, Discernment”, the course delves deeper into content based on individual, enterprise, and country dimensions, enabling students to grasp corresponding country strategies, laws, and policies. This leads students to social practice and current concerns, cultivating scientific consciousness, engineering mentality, innovation consciousness, and IT literacy, hence establishing a “student-centered” ideological-political education mechanism to promote the all-around development of the students.

##### 4.2 Collaborative Development: Develop the “Four Dimensions, Six Step” Teaching Model to Foster Learning Capability

Based around a “teacher-student-enterprise mentor” collaboration community, the course encourages the integration and co-construction of instructional resources. Following the competency demands of financial big data analysis positions, the course integrates theory and practice and applies a six-step process of teaching: “Inspiration, Guidance, Creation, Exploration, Refinement, and Expansion”. Based on platforms like industrial colleges, training bases, the home furnishing sector, and innovative collaboration platforms, it realizes integration in four dimensions: the ideological-political, the industry-education, the business-finance, and the innovation-competition. This organic combination of learning and work enhances students’ capabilities in exploration, practical operation, problem-solving, and innovation, cultivating professionals prepared to face the new services sectors.

##### 4.3 Foster Multidimensional Competencies, Enhance the “Student Achievement”

### **Evaluation System to Capture Comprehensive Learning Progress**

The course explores the essence of enterprise job needs and dissects primary agendas in business analysis. A tri-party evaluation process among teachers, students, and enterprise guides ensures fairness. A double-track offline-online assessment process, consisting of formative growth assessment, tiered task-based assessment, and outcome review assessment, addresses knowledge, abilities, and literacy at 18 points of evaluation, producing an all-around snapshot of student achievements. Visualization dashboards aggregate flows of information and depict the depth and range of learning in a comprehensive and organized format, highlighting the growth of students.

### **5. Conclusion**

Throughout the course, the students worked through business decision-making analysis assignments at a report completion rate of 100%, substantially enhancing the professional literacy, knowledge, and skill levels, thus attaining the objectives of instruction effectively. The outcomes illustrate how the reform has proven effective in preparing cross-disciplinary talents suited to the evolving needs of the digital economy. These results are further elaborated in the following sections, showcasing the reform's effectiveness in practice.

#### **5.1 Knowledge Internalization and Financial Acumen Improvement to Achieve Effective Learning Outcomes**

With close school-enterprise collaboration and sharing of resources, real enterprise cases and multi-dimensions of evaluation information are applied to eliminate confusion and problems. Under actual practice labs, practice and theory are mixed, promoting professional capabilities along with analysis abilities, and cultivating strong professional ethics and design consciousness. Students explore anomalies, find causes, and design solutions to finish actual financial projects, to accomplish teaching goals efficiently.

#### **5.2 Sharpened Skills and Practical Application Enhanced Core Job Competencies**

By combining actual enterprise scenarios and

leveraging the resources of the home furnishings industry college, the course sets up cooperative studios and financial databases. Student-centered, teachers take the “Inspire, Guide, Create, Explore, Refine, Expand” approach, to induce critical reasoning and enhance problem-solving capabilities. Simulation-based practice replicates real-world financial analysis tasks by assigning specific job roles and incorporating realistic, collaborative, and rotational simulations. This approach trains students in essential analytical techniques such as comparative, trend, and ratio analysis, thereby enhancing their ability to address common and critical challenges in financial big data roles.

#### **5.3 Innovation-Based and Practice-Reinforcing Excellent and Long-Lasting**

By combining jointly constructed industrial colleges and studios, the course ties teaching to operations, research to practice, innovation to application, promoting the entrepreneurial consciousness of the students and resulting in prominent achievements. Students won the First Prize at the 2024 Belt and Road & BRICS Skills Development and Technology Innovation Competition, the Second Prize at the same activity, the First Prize at the 2025 Guangdong Accounting Skills Competition, etc.

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