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Innovating Collaborative Education Mechanisms for Digital-Intelligent Accounting Talent: Practices from an Industry–Academia Integrated School

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Abstract

The rapid growth of the digital-intelligent economy is reshaping the competency structure of accounting professionals, posing challenges for application-oriented universities to reform their training models. This study proposes an integrated framework for cultivating digital-intelligent accounting talent through industry–academia collaboration, based on the establishment of the Digital-Intelligent Accounting Industry School at Fuzhou University of International Studies and Trade. The framework, referred to as the Four-Co Collaborative Education Model, highlights co-developed curricula, co-shared learning environments, co-supervised project-based learning, and co-evaluated learning outcomes. Through curriculum modularization, embedding of real business systems and data, project-based team learning, and a dual-mentor mechanism, the model fosters students' transition from operational skill training to business interpretation, analytical reasoning, and collaborative problem-solving. Empirical results indicate substantial improvement in students' digital competencies, business analytical abilities, and workplace adaptability, while enhancing enterprise participation in the teaching process. Moreover, bidirectional faculty development and knowledge co-creation between university instructors and industry mentors strengthen the sustainability of the educational model. The findings provide practical evidence that deep industry–education integration and authentic scenario-based learning can effectively enhance the employability and developmental potential of accounting graduates, offering a transferable paradigm for digital-intelligent talent cultivation in higher education.

Keywords

Digital-Intelligent Accounting; Industry–Academia Collaboration; Applied Talent Cultivation; Dual-Mentor System; Collaborative Education Model.

1. Introduction

The digital economy is reshaping the role of corporate financial functions, shifting from transaction-oriented bookkeeping to management-oriented value enhancement. Technologies such as artificial intelligence, cloud computing, and data analytics are progressively incorporated into budgeting, cost management, and strategic decision-making, resulting in heightened demand for accounting professionals with integrated, data-driven, and collaborative skills (Lu, 2023; Wu, 2023). Organizations no longer seek accountants who merely possess technical bookkeeping skills; instead, they emphasize the cultivation of

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"business–finance integrated" professionals who understand operational processes, conduct analytical reasoning, and support cross-functional collaboration.

However, accounting education at many application-oriented universities continues to be heavily focused on theoretical instruction and simulated training. The curriculum is often insufficiently aligned with real business processes, digital financial systems, and managerial decision-support tools, while practice teaching tends to rely on idealized or decontextualized case scenarios. As a result, graduates frequently face an extended adaptation period when transitioning to workplace environments (Chen et al., 2024; Bai & Chen, 2023). Simultaneously, university–enterprise collaboration is often confined to internships and job placements, with enterprises assuming a passive role in curriculum development, project supervision, and student assessment. This limits the effectiveness of collaborative education across the full talent development cycle (Tian et al., 2024; Wang et al., 2025).

Against this backdrop, industry–education integration and collaborative training have become essential pathways for improving the quality of applied accounting talent development. To respond to changing industry needs, Fuzhou University of International Studies and Trade launched the Digital-Intelligent Accounting Industry School, implementing reforms such as curriculum restructuring, real business scenario embedding, dual-mentor instruction, and project-based learning. These practices enable students to understand financial activities and managerial logic in authentic business contexts, achieving the educational goal of "learning in real scenarios, practicing in real projects, and integrating within real systems."

Building on the experiences of the Industry School, this study identifies current challenges in cultivating digital-intelligent accounting talent in application-oriented universities, constructs a collaborative education mechanism, and examines its implementation outcomes. The aim is to provide a practical reference for regional undergraduate institutions seeking to enhance talent training quality in the context of digital transformation.

2. Challenges in Cultivating Digital-Intelligent Accounting Talent in Application-Oriented Universities

Despite ongoing reforms in curriculum development, practice teaching, and university–enterprise cooperation, structural contradictions still exist in the cultivation of accounting talent under the context of digital transformation. These issues hinder universities' ability to effectively respond to industry demands for compound, business-oriented, and data-driven accounting professionals (Wu, 2023). The main challenges can be summarized in the following four aspects.

2.1. Misalignment between Curriculum Structure and Digital-Intelligent Competency Requirements

Most accounting programs in application-oriented universities still follow the traditional "basic theory–professional knowledge–practical training" curriculum model, with knowledge structured primarily around "bookkeeping–auditing–reporting" (Shi et al., 2022). However, new business models such as intelligent financial systems, financial shared service centers, and digital finance platforms require students to develop process cognition, system understanding, and business analytical capabilities. Related courses are often offered only as electives or supplemental modules, lacking systematization and progression (Ying et al., 2025). Furthermore, teaching practices tend to emphasize theoretical explanation and case discussion rather than scenario-based learning that integrates business processes, system operation, and data-informed decision-making. This results in a competency gap where students possess theoretical knowledge but struggle to transfer it to real business contexts-leading to a mismatch between "evolving industry needs" and "outdated curriculum content."

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2.2. Idealized Practice Environments Limit Real Business Capability Formation

Practice teaching in many institutions relies heavily on simulation software and standardized instructional cases. Such practice environments often feature clear processes, complete data, and preset operating procedures, which differ significantly from real corporate financial scenarios characterized by data incompleteness, cross-functional coordination, and continuous problem iteration (Bai & Chen, 2023). Students may perform well in controlled simulation tasks, but when faced with authentic workplace situations, they often "do not know where to start." Consequently, their practical ability remains at the operational level, lacking competencies in problem diagnosis, logical reasoning, and solution formulation. In other words, practice teaching fails to create sufficient "complexity exposure" and "contextual tension," limiting deeper capability development.

2.3. Shallow University–Enterprise Collaboration and Lack of Mechanism-Based Support for Co-Education

Although most universities have established internship bases, university–enterprise cooperation primarily focuses on internships, recruitment activities, and short-term corporate visits. Enterprises are not deeply involved in curriculum co-development, project supervision, or learning assessment, functioning more as "employers" than "co-educators." Meanwhile, curriculum design is often guided by disciplinary structure rather than competency-based job role expectations, leading to misalignment between educational objectives and industry requirements (Tian et al., 2024). As a result, collaboration takes on a passive form in which "universities teach while enterprises observe," weakening the integration of theory and practice and making it difficult to cultivate high-level workplace readiness.

2.4. Insufficient Dual-Qualified Faculty and Limited Instructional Capacity for Digital-Intelligent Training

Table 1. Key Challenges in the Cultivation of Digital-Intelligent Accounting Talent

Key Challenge	Manifestations	Root Causes
Curriculum–competency mismatch	Curriculum organized around traditional accounting logic; digital-intelligent courses fragmented and elective-based; weak competency progression	Outdated job competency profiles; training plans not aligned with shared service and digital platform environments
Idealized practice environments	Standardized simulation data and processes reduce exposure to real business uncertainty; weak diagnostic and analytical skills	Lack of real data-sharing and deep enterprise participation in practice design
Shallow university–enterprise cooperation	Enterprise involvement limited to internships and recruitment, lacking co-design and co-evaluation	Absence of institutionalized co-education governance mechanisms
Dual-mentor capacity gap	University faculty strong in theory but weak in system practice; enterprise mentors experienced but pedagogically weak	Lack of integrated "teaching–practice circulation" faculty development system

Digital-intelligent accounting education requires instructors to possess not only professional accounting knowledge but also an understanding of financial shared service workflows, intelligent financial systems, and cross-department business analysis. However, many university faculty development models still prioritize academic research over industry practice, limiting opportunities for field-based experience and system operation. This creates a situation where faculty "know theory but lack system-based practical understanding." Conversely,

ISSN: 2688-9323

enterprise mentors possess rich business experience but often lack instructional design and pedagogical skills, making it difficult for them to assume full teaching responsibilities (Wang & Zhang, 2025). Thus, a structural competency gap emerges: "university faculty understand teaching but lack system practice; enterprise mentors understand practice but lack teaching methodology," hindering the effective implementation of a dual-mentor collaborative model.

To further clarify these issues, Table 1 summarizes the structural contradictions in cultivating digital-intelligent accounting talent in application-oriented universities.

3. The Overall Framework of the Collaborative Education Model for Digital-Intelligent Accounting

3.1. Reframing Talent Training Objectives: From Task Execution to Competency Development

With the deepening of digital transformation, the competency requirements of financial positions have shifted from operational, bookkeeping-oriented skills to integrated capabilities involving business comprehension, system coordination, and data-driven analysis. Drawing on job profile analysis and enterprise interviews, the Digital-Intelligent Accounting Industry School reconceptualized its training objectives, shifting the focus from fragmented knowledge acquisition to the systematic development of competency frameworks.

Thus, the talent cultivation process emphasizes guiding students to develop data awareness, understand the logical relationships between financial systems and business processes, and acquire the ability to identify, analyze, and articulate managerial problems. Students are encouraged to progress from accounting technicians who merely "perform bookkeeping tasks" to professional financial practitioners who can understand business operations, analyze business drivers, articulate insights clearly, and collaborate effectively across departments.

3.2. Modular Curriculum Reconstruction Centered on Business Scenarios

In curriculum design, the Industry School abandons the conventional textbook-centered approach and instead organizes course content around real business scenarios and job competency requirements. A progressive curriculum system has been developed, consisting of foundational platform courses, core business process courses, integrated practical courses, and innovation-oriented extension courses.

The curriculum emphasizes the embedded nature of financial activities within operational processes. In core courses such as budgeting, cost management, and internal control, instruction adopts business process sequences as the analytical framework so that students understand the rationale behind financial decisions. In integrated practice courses, students use real enterprise data to perform business modeling and management diagnosis. In innovation-oriented courses, students work collaboratively to conduct inquiries into practical problems and develop solution strategies.

This curriculum structure supports the integration of financial knowledge, business logic, and data analysis, enabling students to transition from contextual understanding to independent application in real business situations.

3.3. Embedded Project-Based Practice Using Real Business Environments

To address the limitations of conventional simulation-based practice teaching, the Industry School collaborates closely with financial shared service centers, accounting firms, and financial technology companies to incorporate real business workflows, datasets, and decision contexts into the learning process. Students participate in authentic business tasks such as expense reimbursement processing, cost allocation, audit workpaper preparation, internal control testing, and RPA workflow development.

ISSN: 2688-9323

In these environments, students encounter data ambiguity, process variability, and cross-functional communication demands. These conditions encourage students to exercise diagnostic reasoning, information synthesis, and analytical judgment. Their learning progression evolves from basic operational execution to independent analysis and, ultimately, to process optimization. Learning thus moves beyond procedural imitation and supports the development of systemic thinking and managerial cognition.

3.4. Establishing a Dual-Mentor System and Multi-Dimensional Evaluation Framework

The Industry School implements a dual-mentor system in which university faculty and enterprise mentors jointly participate in teaching and supervision. University faculty provide theoretical frameworks and methodological guidance, while enterprise mentors interpret real business scenarios, illustrate workflow logic, and offer practical feedback. This collaboration enables the effective integration of academic knowledge structures with practice-based experiential understanding.

A multi-dimensional evaluation system is also established, incorporating assessments from university faculty, enterprise mentors, and industry experts. Evaluation criteria reflect process performance, project outcomes, collaboration quality, and competency growth potential. The focus shifts from determining whether students have simply completed tasks correctly to examining the rationale behind their decisions and their ability to apply knowledge flexibly in unfamiliar contexts. This approach forms a continuous and developmental evaluation cycle that supports ongoing competency enhancement.

4. Implementation Pathways of the Industry–Academia Collaborative Model

4.1. Establishing a University–Enterprise Co-Governance Organizational Structure

At the organizational level, the Industry School follows the principle of 'co-developing curricula, co-cultivating faculty, co-sharing platforms, and co-evaluating outcomes." Rather than relying on temporary or project-based cooperation, the School has built stable collaborative relationships with financial shared service centers, accounting firms, and financial technology enterprises. Through institutionalized mechanisms such as a joint advisory board, curriculum steering committee, and dual-mentor teams, enterprises engage directly in key stages such as talent cultivation program design, curriculum and case resource development, practical project selection, and student assessment. This ensures alignment between educational objectives and real workforce competency requirements, shifting the cultivation model from unilateral institutional design to shared construction of development goals. In this structure, enterprises are no longer merely recipients of talent outcomes, but active contributors to the educational process, forming a sustainable support system for curriculum reform and practical learning integration.

4.2. Integrating Real Business Systems and Data into Classroom Teaching

In instructional implementation, the Industry School introduces actual enterprise financial systems and operational data into the classroom, transforming the classroom into an extension of the business workplace. Instead of relying solely on simulation tools or idealized scenarios, students engage in authentic financial processes such as expense reimbursement, budget execution tracking, internal control review, audit working paper development, and robotic process automation (RPA) configuration within real enterprise platforms.

ISSN: 2688-9323

This learning approach-characterized by learning within the system and thinking within the scenario-exposes students to complex, ambiguous, and uncertain business environments. Such exposure strengthens their ability to understand business workflows, identify process risks, and construct logical reasoning paths. By situating knowledge within real application contexts, students internalize theoretical concepts as transferable professional competencies rather than isolated classroom knowledge.

4.3. Project-Based, Team-Oriented Deep Learning Practice

Project-based action learning serves as the core organizational form of practice teaching. Students work collaboratively to complete end-to-end business analysis, diagnosis, and improvement tasks. For instance, in projects involving budget variance analysis, internal control process redesign, or identification of RPA automation opportunities, teams conduct data collection, analytical processing, problem modeling, and solution development under the joint guidance of enterprise mentors and university faculty. The final outputs take the form of professional presentations and documentation.

This collaborative learning model enhances students' abilities in problem decomposition, structured thinking, communication, argumentation, and solution negotiation. Through iterative discussion and collective decision-making, students refine their cognitive frameworks and develop deeper understanding and analytical judgment in addressing financial management issues.

4.4. Multi-Subject Joint Evaluation and Development-Oriented Feedback

The Industry School has established a multi-dimensional evaluation mechanism involving university instructors, enterprise mentors, and industry professionals. Evaluation criteria incorporate process performance, project outcomes, evidence of competency progression, and workplace adaptability, replacing examination-based assessment as the sole indicator of achievement. Enterprise mentors focus on business logic rigor, data analysis quality, and feasibility of solutions, while university faculty evaluate disciplinary expression, teamwork, and reflective capacity.

This comprehensive evaluation system transforms classroom outputs into tangible learning evidence and converts learning processes into documented growth trajectories. It shifts the evaluation focus from judging learning results to facilitating competency development, thereby supporting continuous improvement and progressive skill formation.

5. Analysis of Implementation Outcomes

5.1. Significant Improvement in Students' Digital and Business Analytical Capabilities

Following the implementation of the collaborative education model, notable changes have occurred in students' competency structures. Under the traditional training model, students typically developed proficiency in bookkeeping and routine accounting tasks but demonstrated limited competency in system operation, business process comprehension, data analysis, and managerial interpretation.

Embedding real enterprise systems, operational data, and practical business problems into courses and projects allows students to shift their focus from 'completing accounting entries' to understanding business logic, diagnosing managerial issues, and developing actionable recommendations. Comparative evidence from learning portfolios, project presentations, and classroom performance shows clear improvement in students' ability to trace shared-service workflows, analyze budget execution deviations, identify cost structure drivers, and detect internal control weaknesses. Particularly in scenarios characterized by incomplete data and

ISSN: 2688-9323

ambiguous information flows, students demonstrated clearer reasoning, structured analytical processes, and evidence-based conclusions.

This transformation indicates a shift from skill-oriented learning to logic-based and judgment-oriented learning, reflecting the phased formation of digital-intelligent competency chains.

To further illustrate the structural improvement in competencies, Table 2 compares student capability performance before and after model implementation.

Table 2. Comparison of Student Competency Development Before and After Implementation

Competency Dimension	Traditional Training Model	Industry School Collaborative Model
System operation skills	Training limited to simulation software and standardized bookkeeping tasks	Capable of completing workflow tracking, entry processing, and data recording in real shared-service systems
Business process understanding	Fragmented and disconnected understanding of business chains	Able to analyze financial matters within procurement, budgeting, cost control, and operational contexts
Data analysis capability	Able to compute basic indicators, but limited in analytical reasoning	Able to perform variance analysis, cost decomposition, and internal control risk identification based on real business data
Communication and collaboration	Classroom participation mostly responsive, lacking structured expression	Able to perform role division, present proposals, and defend viewpoints in team-based practice
Problem diagnosis and improvement	Solutions tend to be theoretical or templated	Able to propose feasible optimization plans aligned with real organizational conditions

5.2. Transition from Teacher-Centered Instruction to a Learning Community Model

In terms of instructional organization, the Industry School has shifted classroom dynamics from the traditional "teacher lecturing–student receiving" model to a learning community jointly formed by teachers, enterprise mentors, and students. University instructors transition from knowledge transmitters to facilitators of inquiry and design of learning processes. Enterprise mentors shift from narrators of experience to cognitive catalysts who guide students in unpacking business problems. Students take on active roles in inquiry, information synthesis, and argumentative reasoning.

Classroom discourse shifts from answering predefined questions to collaboratively constructing and debating hypotheses grounded in authentic business contexts. Learning becomes highly participatory, problem-driven, and interaction-oriented. This transformation enhances students' abilities in communication, negotiation, reflection, and knowledge co-construction, turning the classroom into a space where knowledge, methodology, and practice logic develop concurrently.

5.3. Strengthened University–Enterprise Collaboration Enhances Students' Workplace Trainability

As enterprises deepen their participation in curriculum development and project practice, the cooperation model shifts from resource provision to co-development of talent formation processes. In project evaluations and mentor feedback, students were consistently recognized for improved business adaptability, system proficiency, communication coordination, and depth of analytical reasoning. Enterprise mentors noted that students were able to understand workflow logic in a short period and establish clear linkages between data patterns and management outcomes, demonstrating strong growth potential and workplace trainability.

ISSN: 2688-9323

Notably, enterprise evaluation criteria shifted from "Can the student work independently upon entry?" to "Does the student exhibit sustainable learning capacity and developmental potential?" This marks a shift from static competency matching to dynamic developmental assessment, laying a positive foundation for students' long-term success in digital-intelligent accounting roles.

5.4. Dual-Mentor Model Facilitates Bidirectional Enhancement and Knowledge Co-Creation

The dual-mentor model promotes mutual empowerment between university faculty and enterprise mentors. University instructors, through field immersion in shared service centers, accounting firms, and tax technology platforms, continuously update their understanding of intelligent financial systems, process control mechanisms, and digital work tools, ensuring teaching content remains technologically and methodologically current. Meanwhile, enterprise mentors gradually develop pedagogical awareness and structured knowledge expression through ongoing engagement with students and co-teaching processes.

Real enterprise workflow diagrams, risk matrices, and management evaluation models are integrated into teaching resources, while students' analytical questions prompt enterprise mentors to reflect on their operational logic and managerial assumptions. This creates a knowledge circulation system involving students, faculty, and enterprise professionals, becoming a sustainable driving force behind the ongoing development of the Industry School model.

6. Conclusion

The rapid development of the digital-intelligent economy is reshaping corporate financial management systems and job competency structures. The role of accounting is shifting from bookkeeping and compliance functions toward management support and value creation, raising new expectations for talent cultivation in application-oriented universities. Traditional training models centered on knowledge transmission and skill-based practice are no longer sufficient to meet the industry demand for professionals who possess business insight, data analytical ability, and digital collaboration skills. Therefore, constructing new talent cultivation models aligned with digital transformation has become a strategic priority in accounting education reform.

Drawing on the practices of the Digital-Intelligent Accounting Industry School, this study establishes an integrated talent cultivation framework through curriculum restructuring, the embedding of real business scenarios, project-based deep learning, and the dual-mentor collaborative mechanism. The findings show that introducing enterprise systems, operational data, and managerial decision contexts into teaching can effectively facilitate students' progressive development from procedural skill acquisition to business reasoning, analytical interpretation, and solution-oriented thinking. The deep collaboration between universities and enterprises in curriculum co-development, practical training, and assessment shifts talent cultivation from a single-institution initiative to a multi-stakeholder co-construction model, significantly improving students' industry adaptability and long-term developmental potential. Meanwhile, the dual-mentor and multi-dimensional evaluation systems provide ongoing momentum for continuous improvement in teaching quality and talent development outcomes.

However, further challenges remain in sustaining and scaling this collaborative education model, including institutional mechanisms for ensuring enterprise participation, continuous updating of real business scenario-based teaching resources, and the integration of pedagogical and practical expertise across different types of instructors. Future work may focus on developing quantitative competency evaluation frameworks, tracking student developmental

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trajectories, expanding the scope and depth of enterprise collaboration, and building regional industry–education partnership platforms to enhance the model's transferability and broader applicability.

Overall, the construction and implementation of the Digital-Intelligent Accounting Industry School demonstrate that grounding talent cultivation in industry needs, advancing deep industry–education integration, and promoting curriculum–practice alignment constitute an effective pathway for transforming and upgrading accounting programs in application-oriented universities. The experience provides valuable implications and practical reference for promoting digital-intelligent accounting education reform in higher education institutions.

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