International Journal of Business and Management; Vol. 20, No. 1; 2025
ISSN 1833-3850 E-ISSN 1833-8119
Published by Canadian Center of Science and Education

Pathway for Cultivating Practical Abilities of Intelligent Accounting Talents in Application-Oriented Undergraduate Universities

Xi Zhao[1], Yanan Wang[2], Bing Lu[1], Keming Xu[1]

[1] School of Business, Xianda College of Economics and Humanities Shanghai International Studies University, Shanghai, China

[2] Fudan University Press, Shanghai, China

Correspondence: Xi Zhao, School of Business, Xianda College of Economics and Humanities Shanghai International Studies University, Shanghai, No.390, East Tiyu Hui Road, China. Tel: 021-51278010. E-mail: 1410070@xdsisu.edu.cn

Received: November 23, 2024 Accepted: December 26, 2024 Online Published: January 4, 2025
doi:10.5539/ijbm.v20n1p97 URL: https://doi.org/10.5539/ijbm.v20n1p97

Abstract

The burgeoning digital economy and the incessant transformation and upgradation of industries have precipitated novel demands for the cultivation of accounting professionals. The exigency for intelligent accounting talent has been accentuated by the industry and is increasingly being deliberated upon within the context of the paradigm shift and evolution of accounting education. Application-oriented universities are entrusted with the responsibility of nurturing pragmatic professionals adept at adapting to regional economic exigencies. However, a plethora of contemporary application-oriented universities are confronted with challenges in accounting education, encompassing imprecise talent development objectives, an obsolete curriculum structure, inadequate practical training components, and feeble faculty competencies. In an endeavor to surmount these quandaries, our university has explored a pathway for cultivating the practical abilities of accounting professionals through a paradigm predicated on "digital empowerment, industry-education synergy, and knowledge-action synergy." This paper propounds measures such as digital empowerment, the integration of "Course-Competition-Certification," and industry-education collaboration to nurture intelligent accounting talent that is congruous with the prevailing socioeconomic development.

Keywords: pathway, intelligent accounting, application-oriented, cultivating practical abilities

1. Introduction

1.1 Introduce the Problem

Since the 1990s, the digital economy has burgeoned, profoundly metamorphosing the global economic landscape (Tapscott, 1997; Brynjolfsson & McAfee, 2014). Digital technologies have exerted a profound impact on all facets of economic activities, encompassing production, distribution, exchange, and consumption. Concomitant with the continual advancement of technologies, traditional industries are accelerating their digital transformation (Schwab, 2017). Artificial intelligence (AI), big data, cloud computing, and other cutting-edge technologies have been increasingly integrated into various sectors, providing intelligent decision-making support and driving the smart upgradation of industries (Davenport & Kirby, 2016; McAfee & Brynjolfsson, 2017).

In February 2023, the Central Committee of the Communist Party of China and the State Council promulgated the "Overall Layout Plan for the Construction of Digital China," which accentuates the necessity to enhance digital thinking, digital cognition, and digital skills in the process of promoting the development of the digital economy (The State Council of China, 2023). The plan also propounds the coordinated development of a range of digital disciplines and the cultivation of innovative, application-oriented, and interdisciplinary talent.

Within the context of digital economic development, the concept of intelligent finance has gradually matured in the accounting field and has been widely discussed and applied (Kokina & Davenport, 2017; Richins et al., 2017). Intelligent finance refers to the utilization of advanced technologies such as AI, big data analytics, cloud computing, and robotic process automation (RPA) to mine and analyze financial data, thereby improving the efficiency and quality of financial decision-making (Dai & Vasarhelyi, 2017; Richins et al., 2017). The advent of

intelligent finance has transformed the role of accounting from traditional bookkeeping and reporting to data-driven analysis and decision support (Felden & Chamoni, 2007; Richins et al., 2017). The role of accountants has undergone a fundamental metamorphosis—from being backend bookkeeping operators to becoming core business partners in helping companies with strategic planning, resource optimization, efficiency enhancement, and risk reduction (Frey & Osborne, 2017; Kokina & Davenport, 2017).

This transformation demands that accountants possess higher technical literacy and interdisciplinary knowledge (Frey & Osborne, 2017; Richins et al., 2017). It has also propelled financial management toward a more intelligent, real-time, and precise approach. Such a shift calls for new educational frameworks and practical training models to cultivate accounting professionals who are equipped with both financial expertise and digital competencies (Pan & Seow, 2016; Richins et al., 2017). These professionals will be instrumental in driving the strategic direction of organizations and enhancing their operational efficiency in the digital age.

1.2 The Connotation of Talent Cultivation for Intelligent Finance

The quintessence of the digital economy era is the new round of socio-economic metamorphosis driven by digital information technologies (Negroponte, 1995; Tapscott, 1997). As technologies such as "Big Data, Artificial Intelligence, Cloud Computing, Internet of Things, and Blockchain" (often abbreviated as "Big Data, AI, Cloud, IoT, Blockchain") mature and proliferate rapidly, organizational transformations and efficiency improvements have triggered industrial upgradations (Schwab, 2017; Brynjolfsson & McAfee, 2014). Standardized business processes are gradually being supplanted by machines, while traditional accounting functions are attenuating. Concurrently, the role of accountants in strategic planning, business decision-making, and creating corporate value has become increasingly prominent (Richins et al., 2017; Frey & Osborne, 2017). Consequently, traditional accounting talent cultivation is confronted with the challenge of upgradation, as the market urgently demands intelligent accounting professionals proficient in digital and intelligent technologies. Intelligent accounting talent must not only possess traditional financial skills but also adapt to a new, technology- and data-driven work environment. Specifically, intelligent finance professionals should have the ability to apply new technologies and tools, possess data analysis skills, engage in strategic thinking and decision support, and have interdisciplinary and comprehensive competencies.

With the widespread application of artificial intelligence (AI), automation tools, and big data technologies, accountants are required to master a range of technological tools to enhance work efficiency and analytical capabilities (Huang & Vasarhelyi, 2019; Kokina & Davenport, 2017). They must be able to utilize robotic process automation (RPA) and similar technologies to automate routine financial tasks (e.g., invoice processing, expense approvals, bookkeeping) (Moffitt et al., 2018). Accountants must also be proficient in data analysis tools such as Excel, Power BI, Tableau, and statistical analysis skills, enabling them to extract valuable insights from large datasets and visualize the results to support decision-making (Sledgianowski et al., 2017). In addition, they should comprehend how to collect, process, and analyze big data, especially large-scale transaction data and customer data related to finance, to uncover trends and business opportunities (Dai & Vasarhelyi, 2017; Warren Jr et al., 2015). Furthermore, an understanding of the rudimentary principles of AI and machine learning is essential, enabling accountants to leverage AI for financial forecasting, risk assessment, and intelligent analysis, thereby improving the accuracy and timeliness of financial decision-making (Richins et al., 2017). Familiarity with cloud-based financial systems is also crucial, as accountants should be able to effectively utilize these systems for financial management, report generation, and budgeting (Liang, 2017).

The intelligent accounting era emphasizes data-driven financial decision-making, and accountants need to possess deep financial analysis capabilities (Dai & Vasarhelyi, 2017). They must be able to conduct in-depth analysis of financial data to identify potential business problems, risks, and opportunities. Accountants should be skilled in utilizing historical data and predictive models for financial forecasting and budgeting, allowing them to identify possible financial issues or market fluctuations in advance and support strategic decisions (Huerta & Jensen, 2017). Additionally, accountants must be able to leverage intelligent technologies for risk forecasting, identify financial risks such as liquidity risks, tax risks, and market volatility, and propose measures to address them (Richins et al., 2017).

Intelligent accounting is not only the integration of technology and operations but also places a significant emphasis on the involvement of accountants in corporate strategy (Felden & Chamoni, 2007). Accountants must be able to comprehend and analyze the company's financial position, market environment, and industry trends from a strategic perspective to support top-level decision-makers in strategic planning. They must provide financial decision support for the management, such as optimizing capital structure, mergers and acquisitions advice, and investment decisions, based on data and analytical outcomes (Richins et al., 2017). Accountants

should also collaborate closely with other departments (such as marketing, operations, and IT) to provide cross-departmental financial data support, helping the company achieve its overall goals (Pan & Seow, 2016). Additionally, accountants must have sharp insight, able to identify pain points in financial management and innovate financial management models using new technologies and methods to improve work efficiency and optimize resource allocation (Frey & Osborne, 2017).

In the intelligent accounting era, accountants are no longer just data processors; they are also strategic decision supporters and business partners (Richins et al., 2017). Therefore, communication and coordination skills are particularly important. Accountants must be able to effectively communicate with various departments (e.g., technology, operations, marketing), coordinate the work of the finance department with other functional areas, and ensure the timely transmission and sharing of financial data (Pan & Seow, 2016). They must be able to lucidly convey complex financial data and analytical results to the management team, helping them make informed decisions. Strong reporting and presentation skills are essential, enabling accountants to transform numbers into meaningful strategic insights (Felden & Chamoni, 2007).

The core goal of talent cultivation in the intelligent finance era is to develop professionals who can integrate technology with accounting. These professionals should not only efficiently handle traditional financial tasks but also utilize intelligent technologies for data analysis and decision support, while also possessing the skills for change management, cross-departmental collaboration, and innovation (Pan & Seow, 2016). They will drive the intelligent and digital transformation of financial management.

2. Method

Application-oriented undergraduate colleges are positioned to serve regional economies, and they should continuously adjust their talent cultivation standards, curriculum design, and practical training to meet the actual needs of enterprises (Zhu et al., 2021). There are approximately 200 application-oriented universities in China, primarily regional institutions, particularly in economically developed small and medium-sized cities and coastal areas. These regions are also pioneers in industry transformation and the digitalization of enterprises (Ding & Xu, 2022).

Accounting majors aim to equip students with knowledge and skills in financial management, accounting, auditing, and taxation. Traditional accounting education has focused on basic accounting knowledge and bookkeeping. However, with the rise of the digital economy, application-oriented universities should not limit their accounting talent cultivation to foundational skills but should shift their focus to functions like business-finance integration, decision support, and financial planning in the context of cloud technology (Browne et al., 2022; Tan et al., 2022). The goal is to cultivate application-oriented intelligent accounting professionals who are adaptable to social and industry developments within the framework of the digital economy. In the past, the talent cultivation system has struggled to meet the demands of the data-driven and intelligent era, and this is evident in the following four aspects.

2.1 Inaccurate Talent Training Objectives

In the context of rapid digital economic development, the accounting industry is undergoing continuous transformation and upgradation, raising the bar for accounting talent. However, some application-oriented universities still focus on training traditional accounting professionals who mainly possess basic accounting and bookkeeping skills. These universities often overlook the cultivation of critical capabilities, such as data analysis, information technology, and innovative thinking. The rapid changes in the industry and the specific demands of different companies have resulted in a mismatch between the curriculum and industry standards. Some universities have failed to establish deep connections with industries and failed to comprehensively understand the actual demands of enterprises, resulting in a deviation between students' knowledge and abilities and market needs. Consequently, graduates often fail to meet the expectations of the job market.

2.2 Unreasonable Curriculum System

The accounting knowledge required in the intelligent era is rapidly evolving, yet some application-oriented undergraduate colleges have outdated accounting curricula that are disconnected from actual industry needs. Many of these colleges offer a rigid accounting curriculum that primarily focuses on standardized traditional accounting knowledge, neglecting emerging financial technologies, new business models, and industry trends. This results in students having a narrow knowledge base, lacking innovation awareness, and inadequate comprehensive abilities. Additionally, the curriculum system is often overly focused on foundational courses, with a limited number of interdisciplinary courses, thereby neglecting practical, innovative courses that foster students' overall quality. The curriculum structure and teaching model are insufficient to meet the needs of the

information technology development and industry transformation.

2.3 Inadequate Practical Training

In the intelligent era, practical accounting skills have become a key measure of accounting talent. However, on the one hand, some application-oriented universities lack sufficient investment in practical teaching, and the construction of practice bases is lagging behind. This leads to students having weak hands-on skills and inadequate overall practical abilities, which do not meet the demands of industry structural adjustments and transformation. On the other hand, the school-enterprise cooperation mechanism is inefficient, and the effectiveness of practical teaching is suboptimal. Although some application-oriented universities have cooperative relationships with enterprises, most collaborations are superficial, limited to internships or employment recommendations, and lack long-term, stable partnerships. The depth and breadth of enterprise involvement in teaching are insufficient, and the industry needs are not adequately translated into teaching content and practical opportunities. The depth and substance of school-enterprise cooperation are often constrained by multiple factors. Some universities lack long-term, stable collaboration mechanisms with enterprises, and enterprises show low levels of investment and participation in education, making it difficult to provide sufficient resources and support.

2.4 Weak Faculty Strength

Application-oriented universities often face issues such as an unbalanced faculty structure and a lack of practical experience among teachers. While most accounting professors have strong academic backgrounds, they often lack sufficient practical experience in the enterprise sector, particularly in areas such as modern financial management, the use of information technology tools, and understanding new industry trends. In the intelligent era, accounting education needs to keep pace with industry developments, and without faculty members who are well-versed in emerging technologies and intelligent finance, it is challenging to provide effective guidance to students. Given the above issues, traditional educational systems and models are not aligned with industry needs. The curriculum, teaching methods, and faculty competencies require urgent updating and enhancement. Application-oriented universities must re-evaluate their accounting talent cultivation objectives, optimize the curriculum system, strengthen faculty development, and improve practical teaching levels in order to cultivate high-quality intelligent accounting talent that meets the demands of the times. Only by doing so can accounting graduates from these universities stand out in the competitive job market.

3. Results

In this context, application-oriented universities must continuously explore and implement intelligent accounting talent development models to enhance the cultivation of practical competence, elevate students' comprehensive qualities, and train application-oriented accounting professionals who can adapt to industry transformation and upgrades in the digital economy era. Our university has distilled and summarized a "Digital Empowerment, Industry-Education Integration, and Knowledge-Action Synergy Pathway for Cultivating Practical Competence in Accounting Majors," as illustrated in Figure 1.

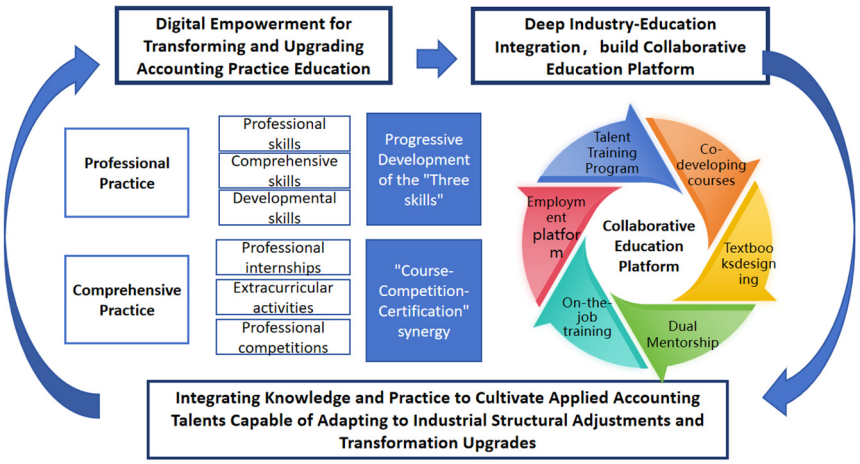

Figure 1. Pathway analysis diagram

This pathway first requires aligning with industry talent demands, reshaping the training objectives for intelligent accounting professionals, and employing reverse design in the talent development plan. Our university has conducted thorough investigations of the industry and regional economic development to clarify the talent cultivation objectives for application-oriented intelligent accounting professionals. Based on these objectives and required competencies, we have reversed the design process, constructing a curriculum system that combines theoretical courses with practical courses to support the talent development goals and ensure congruence between talent supply and demand.

On the other hand, we have promoted industry-education integration through the creation of collaborative education platforms. Leveraging the establishment of industrial colleges, our institution and enterprises have deeply integrated across various stages of student cultivation, from validating the Talent Training Program to co-developing practical courses, designing textbooks, and implementing dual mentorship for both teaching and on-the-job training. Ultimately, we aim to establish a comprehensive employment platform that forms a closed-loop talent cultivation system, ensuring the development of application-oriented intelligent accounting professionals who can meet the needs of industry restructuring and transformation.

3.1 Digital Empowerment for Transforming and Upgrading Accounting Practice Education

In line with the talent development goals for accounting in the digital era, universities should extract the essence of digital information technologies and adopt a reverse-driven design that focuses on educational outcomes. By reorganizing the practical teaching system, building educational platforms, integrating enterprise resources, and establishing dual mentorship models, we aim to integrate professional competence with digital application literacy. This approach creates the necessary conditions for producing accounting professionals who are well-suited to the development of the digital economy, ensuring a proper alignment between the supply and demand for intelligent accounting talent.

On the other hand, the digital empowerment of practical courses optimizes the "Professional Practice + Comprehensive Practice" curriculum model. The professional practice courses incorporate intelligent financial technology application knowledge, focusing on the progressive development of students' core professional skills, comprehensive skills, and developmental skills. Comprehensive practice includes professional internships, extracurricular activities, and professional competitions, which complement and support professional practice. The digital empowerment of the practice curriculum involves updating and developing new courses that contribute to the progressive enhancement of practical skills. New courses in the digital curriculum include Database Application Technology, Financial Shared Center Training, Intelligent Finance & RPA Application, Financial Digital Applications, Financial Big Data Analysis & Decision-Making, and Blockchain in Financial Applications, as shown in Table 1. Through the digital empowerment of the practical curriculum and the development of course resources in collaboration with enterprises, we reinforce students' professional foundations, improve their overall abilities, and foster professional growth. Additionally, universities should establish digital financial experiment platforms that provide enterprise-level financial information systems and big data analytics platforms, allowing students to practice processing, analyzing, and supporting financial decision-making.

Table 1: Practical course system

Course Type	Competency Classification	Course Name
Professional Practice	Professional skills	Enterprise ERP Comprehensive Training
		Accounting Information Systems Training
		Auditing Practice Training
		Python Programming and Applications
	Comprehensive skills	Database Application Technology
		Financial and Accounting Data Processing
		Financial Shared Services Center Training
		Intelligent Finance and RPA Robot Applications
		Basic Applications of Financial Digitalization
		Cross-disciplinary Comprehensive Training
	Developmental skills	Financial Big Data Analysis and Decision-making
		Blockchain and Financial Applications
		Budget Preparation

Comprehensive Practice	Business Data Analysis Financial Decision-making Simulation Training Social Practice Professional Awareness Internship Professional Internship Graduation Internship Graduation Thesis/Design Innovation Practice Training Entrepreneurship Guidance

3.2 Integration of Discipline Competitions, Professional Certification, and Practical Courses through the "Course-Competition-Certification" Synergy

Discipline competitions, professional certifications, and practical courses should be organically integrated to facilitate the progressive development of practical competencies through the "Course-Competition-Certification" synergy. On one hand, the knowledge and skill requirements of academic competitions should be embedded into the corresponding courses. By integrating competition selection into teaching and assessment, we could improve the efficiency of both teaching and learning. This integration motivates students to participate actively, creating a channel for the progressive enhancement of professional competencies throughout the entire teaching and learning process.

On the other hand, professional certification requirements should guide curriculum design. By utilizing courses as a medium, professional standards, industry standards, and regulations should be incorporated into the practical teaching content. This will cultivate accounting professionals who meet industry demands, ensuring that graduates possess the necessary skills and knowledge for the professional job market.

3.3 Deep Industry-Education Integration: Dual Mentorship and Collaborative Education Platform for Teaching, Practice, and Employment

Universities should establish long-term strategic partnerships with large enterprises, financial shared service centers, consulting firms, and other industry players. In the teaching domain, industry mentors should participate in courses, professional seminars, and share their expertise on industry development, emerging applications, and case studies with students. Industry experts should also be involved in the creation of teaching plans, course development, textbook writing, and the construction of practical training facilities, embedding the latest industry practices and cutting-edge technologies into the curriculum.

In terms of practical training, universities should organize internships for students in companies, and establish a dual mentorship system, with both academic and industry mentors providing guidance. Beyond traditional internships, universities should offer career role-playing, mock interviews, and job simulation courses to help students prepare for the realities of the professional workplace. The dual mentorship system facilitates the creation of a collaborative education platform, bridging the gap between teaching, practice, and employment, and ensuring seamless transitions from academia to industry.

3.4 Enhancing Faculty's Intelligent Competence: Professional Development and Teaching Innovation

Universities should regularly organize training sessions and technical workshops on intelligent finance for faculty members, enabling them to master the latest financial information tools, AI technologies, and big data analytics applications in financial management. Additionally, faculty members should be encouraged to participate in industry-academic collaborations, gaining hands-on experience in intelligent finance systems and data analysis tools through practical teaching engagements with enterprises.

Moreover, providing faculty with opportunities for industry immersion, such as short-term industry placements or project participation, will help them deepen their understanding of industry trends and enhance their practical capabilities. Finally, universities should encourage faculty to integrate intelligent teaching platforms and data analytics technologies into their pedagogy. By leveraging online platforms, virtual laboratories, and other interactive tools, universities can improve the interactivity and effectiveness of teaching, facilitating students' acquisition of intelligent finance skills. These measures will not only enhance the faculty's ability to teach using modern tools but will also drive the modernization and innovation of the entire accounting curriculum.

4. Discussion

The proposed "Digital Empowerment, Industry-Education Integration, and Knowledge-Action Synergy"

pathway represents a holistic and empirically-grounded approach to cultivating practical competencies in intelligent accounting talent. This multidimensional strategy directly addresses the key challenges identified in traditional accounting education at application-oriented universities. It synthesizes contemporary theories and best practices to bridge the hiatus between educational outcomes and dynamic industry demands in the digital economy era.

4.1 Digital Empowerment and Experiential Learning

The integration of digital technologies into the accounting curriculum aligns with Kolb's Experiential Learning Theory, which accentuates the pivotal role of concrete experiences in the learning process. Courses like Database Applications, RPA & Intelligent Finance, Financial Big Data Analytics, and Blockchain facilitate the acquisition of technical skills through hands-on activities and simulations, thereby enhancing students' comprehension of abstract concepts. Establishing digital financial experiment platforms creates an authentic learning environment, allowing students to engage with enterprise-level systems, data analytics tools, and decision support applications. This immersive, experiential approach resonates with constructivist learning principles, fostering the development of practical competencies firmly rooted in real-world contexts.

4.2 Synergizing Theory, Application, and Certification

The "Course-Competition-Certification" synergy is grounded in the situated learning theory, which posits that learning is most efficacious when it occurs in authentic contexts and is inextricably linked to practice. By embedding competition requirements into coursework, students are motivated to actively apply theoretical knowledge in practical scenarios, facilitating the transfer of learning. Simultaneously, aligning coursework with professional certification standards ensures graduates possess industry-recognized qualifications, increasing their employability and professional readiness. This synergy exemplifies the principles of constructive alignment, where learning outcomes, instructional activities, and assessment tasks are strategically aligned to promote deep learning and skill development.

4.3 Industry-Education Collaboration and Boundary Crossing

Establishing long-term strategic partnerships with enterprises is underpinned by the boundary crossing theory, which emphasizes the importance of transcending traditional boundaries and promoting knowledge exchange between diverse communities of practice. The involvement of industry mentors in teaching, curriculum development, and practical training facilitates the integration of real-world perspectives and cutting-edge practices, fostering a dynamic interplay between academic knowledge and practical expertise. The dual mentorship system, combining academic and industry guidance, enables students to navigate the boundaries between the academic and professional domains, enhancing their ability to synthesize theoretical concepts and practical applications.

The collaborative education platform embodies the principles of the triple helix model, which advocates for the collaborative interaction among universities, industries, and governments to drive innovation and economic development. This integrated approach not only enhances students' practical skills but also fosters strong industry connections, increasing their chances of securing relevant employment upon graduation and contributing to regional economic growth.

4.4 Faculty Development and Scholarly Teaching

Enhancing faculty competencies is a pivotal aspect of this pathway, aligning with the tenets of the Scholarship of Teaching and Learning (SoTL). Regular training sessions, industry immersion opportunities, and the integration of intelligent teaching platforms equip faculty members with the latest knowledge and skills in intelligent finance, thereby strengthening their teaching effectiveness. This professional development empowers faculty to engage in scholarly teaching, a practice that involves the systematic study of teaching and learning processes, the application of evidence-based strategies, and the dissemination of findings to advance pedagogical practices within the discipline.

By grounding the proposed pathway in established theoretical frameworks and empirically-validated practices, application-oriented universities can effectively navigate the complexities of talent cultivation in the digital economy era. The multifaceted approach ensures that graduates possess the requisite knowledge, skills, and practical experience to thrive as intelligent accounting professionals, thereby addressing the evolving needs of industries and organizations while contributing to regional economic development.

Acknowledgments

This research was supported by several funding projects, including the Ministry of Education's Industry-Education Cooperation and Collaborative Education Program (2022) – Intelligent Finance Course Construction and Practice, the 2023 Shanghai Municipal Key Course Construction Project – Management Accounting, the 2023 Shanghai Municipal First-Class Undergraduate Course Construction Project – Financial Reporting Analysis of Listed Companies, and the 2023 University-Level Teaching Team Development Project – Integration of Business and Finance Course Construction and Teaching Projects.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal and publisher adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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