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Innovation and Practice in Accounting Education Based on STEM Education and Course-based Ethics Education

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Abstract

The digital economy is driving the transformation of accounting education towards interdisciplinary and value-oriented approaches. Addressing the disconnect between traditional teaching theories and practices, as well as the labelling" of ideological and political elements, this study constructs a dual-dimensional integration framework combining STEM and course-based Ethics Education. Through policy safeguards, dynamic evaluation, and resource integration, it promotes the upgrading of accounting education from skill transmission to integrated morality and skills," cultivating new-era talents with both digital literacy and public responsibility to serve the social governance advancement strategy.

Keywords

Course-based Ethics Education; STEM; Accounting Teaching Reform

1. Introduction

In the context of the new era, the deepening development of the digital economy and the disruptive innovations in intelligent technology are fundamentally reshaping the underlying logic and value paradigms of the accounting discipline, thereby imposing multi-dimensional demands for reform on the accounting education system. On the one hand, the traditional accounting functions of the accounting industry are gradually being replaced by automated tools, while strategic decision-making support, risk management, and value creation are increasingly becoming the core missions of accounting professionals[1] . Therefore, the cultivation of interdisciplinary capabilities among accounting professionals has become a new priority direction, which is an inevitable choice to respond to industry changes and enhance professional competitiveness. On the other hand, the National Guidelines for the Construction of Eth-

ics Education in Higher Education Institutions explicitly state that professional education and Ethics Education should move in the same direction, and also emphasise the importance of Ethics Education in course development. In this context, exploring the integration of STEM education concepts and Ethics Education in accounting teaching is both a necessary response to national strategic requirements and a key breakthrough in addressing the bottlenecks in accounting talent cultivation.

2. A Theoretical Framework for Integrating STEM and Ethics Education into Accounting Education

This chapter explores the integration framework of STEM education concepts and course-based Ethics Education in accounting education, providing a reference for accounting education reform.

2.1. Anchoring the dual-core drive of STEM and Ethics Education as the goal of talent cultivation

The core of the dual-core goal-anchoring approach lies in the system's response to the fundamental questions of higher education in the new era: What kind of people should we cultivate? How should we cultivate them? And for whom should we cultivate them?" Specifically, its implementation follows a three-tiered logical approach: macro-level strategic guidance—meso-level capability deconstruction—micro-level course mapping." At the macro-level strategic stage, it aligns with the national strategic orientation of Digital China" and New Liberal Arts" development, clearly defining the goal of cultivating applied, interdisciplinary, outward-looking, and innovative talents with humanistic literacy, scientific spirit, and integrity[2] ; at the meso-level capability dimension, it focuses on the functional attributes of accounting as an infrastructure for economic governance, systematically deconstructs the core capability requirements under digital transformation, and forms five core capability modules covering finance and economics, digital technology, business collaboration, strategic insight, and innovative practice [3] ; At the micro implementation level, through the OBE (Outcomes-Based Education) reverse design mechanism, abstract objectives are concretised into observable and evaluable course competency indicators, ultimately establishing a comprehensive talent development framework and forming a closed-loop goal transmission mechanism[4] .

2.2. STEM competency framework drives the restructuring of accounting professional competencies

The traditional accounting education model, which is centred on textbooks and has clearly defined disciplinary boundaries, has shown significant limitations in the context of digital transformation. With the reconstruction of accounting work scenarios by artificial intelligence technology, the traditional knowledge-based teaching model is insufficient to achieve the desired human capital appreciation effects. In

light of this, breaking through traditional disciplinary barriers and constructing an interdisciplinary knowledge framework has become a key point in addressing the insufficient digital technology application capabilities and lack of interdisciplinary knowledge among accounting professionals.

Specifically, the STEM framework achieves a paradigm shift in accounting education through three innovations: first, it constructs a progressive capability chain of technical understanding-system design-value creation," expanding the role of accounting from record-keeping to strategic support; second, it adopts a cross-disciplinary course matrix, integrating accounting principles, data science, and systems engineering methodologies; third, it establishes a three-dimensional training pathway of theoretical cognition-technical practice-engineering implementation," ensuring that talent cultivation deeply aligns with the demands of intelligent financial scenarios and effectively addresses the shortcomings of static knowledge systems and fragmented practical skills in traditional accounting education[5].

2.3. Integrating Ethics Education into deepening the value connotation of accounting

Ethics Education plays a crucial role in deepening the value implications of accounting. As a value tuner within the STEM competency framework, Ethics Education achieves a dialectical unity between instrumental rationality and value rationality through the bidirectional interaction of value rationality construction and technical ethics training. At the individual level, it cultivates a value consciousness that recognises boundaries in the application of technology and warmth in professional judgment," thereby preventing the erosion of subjectivity caused by the alienation of technology. At the professional level, a value coordinate system is established based on accounting standards as the foundation, business ethics as the boundary, and national strategy as the direction." At the societal level, the value recognition that accounting information is a public good" is shaped, enabling students to understand the governance efficacy of accounting technology in promoting common prosperity[6]. Ultimately, this cultivates new-era accounting talent with both technological insight" and value foresight," transforming them from mere recorders of economic activities into strategic guardians of social governance advancement

3. Practical Pathways for Accounting Education Integrating STEM and Ethics Education

This chapter explores the paths and methods for integrating STEM concepts and course-based Ethics Education in accounting education.

3.1. Building a course ecosystem that integrates accounting with other disciplines

The construction of a course ecosystem that integrates accounting with other disciplines plays a central role in the path of interdisciplinary integration and serves as a key support for advancing accounting education from single-skill training to the development of composite capabilities.

In this process, a modularised course-based Ethics Education system promotes the synergistic coexistence of technical rationality and value rationality. Through a spiral-shaped training pathway of theoretical cognition-technical practice-strategic decision-making," it ultimately shapes a three-dimensional capability framework of technical expertise in data modelling supporting professional precision, ethical soft power through moral reasoning to reinforce professional integrity, and strategic insight through business intelligence to guide innovative directions." This provides a systematic solution for accounting professionals to transition from economic recorders to value analysts.

3.2. Promote dynamic alignment between teaching staff and educational requirements.

As the core driving force in talent cultivation, the establishment of a professional development mechanism for teachers is crucial to the success of blended learning reforms. Teaching innovation in advanced financial accounting courses requires teachers to possess three core competencies: the ability to deeply apply educational technology tools, the ability to dynamically integrate disciplinary frontiers with industrial practices, and the innovative ability to intelligently reconstruct teaching resources. In this context, universities need to establish a teacher development system based on the standardised entry – competency cultivation – practical reinforcement" framework [7].

By implementing the school-enterprise dual mentor system," teachers are deeply involved in real-world projects such as the construction of corporate financial shared service centres and intelligent tax planning. Typical business scenarios, such as the Luckin Coffee financial fraud case, are transformed into a composite teaching case repository combining technical compliance review and professional ethics decision-making." This forms a three-dimensional educational ecosystem where technical tools support cognitive construction, practical projects drive capability advancement, and ethical deliberation guides value shaping."

3.3. Integrate resources to support students' comprehensive development.

Building a collaborative ecosystem that deeply integrates industry and education is an important measure for university accounting programmes to respond to industrial upgrading and new training directions[8]. On the one hand, relying on the city-wide industry-education consortium structure, cross-border resources from tax authorities, accounting firms and technology companies are integrated to form a

three-level progressive course matrix of basic knowledge - specialised training - industry-finance integration." On the other hand, through the innovation of the dual-system" training mechanism, the programme adopts an interactive model of corporate mentors teaching on campus - faculty teams conducting research in enterprises," transforming real-world business scenarios into teaching projects. This enables students to simultaneously enhance their application of intelligent financial tools and professional judgment skills while handling complex tasks such as cross-border payment reconciliation and accounting for convertible bonds. This model not only reinforces traditional skills such as bill processing and report preparation but also cultivates emerging capabilities like internal control process optimisation and value assessment, producing composite accounting talent with both professional competence and forward-looking development potential.

3.4. Comprehensive integration of Ethics Education into the curriculum

The comprehensive integration of accounting professional ethics education in higher education institutions in the new era requires a multi-dimensional, integrated curriculum system as its foundation. This system should incorporate the rule of law, excellent traditional culture, and cutting-edge practical cases into professional teaching. Innovative methods such as case-driven + scenario simulation + blended learning" should be employed to strengthen value-oriented guidance. Leveraging the industry-education collaboration mechanism for talent cultivation, institutional and corporate resources should be integrated. Practical experts should provide guidance, practical training at practice bases, and dual-classroom collaboration to promote the unity of knowledge and action. An evaluation system that balances process-based assessment and integrity points incentives should be established. Digital promotional platforms and themed activities should be utilised to cultivate an immersive integrity culture, forming a closed-loop educational ecosystem that spans knowledge transmission, skill development, and the internalisation of professional ethics.

4. Implementation recommendations

To promote the deep integration of STEM education and Ethics Education in accounting teaching, it is necessary to establish a systematic implementation framework. First, strengthen policy guidance and institutional safeguards. Education authorities should incorporate interdisciplinary integration and Ethics Education into the evaluation criteria for accounting programmes at higher education institutions, guide institutions to develop specialised construction plans, establish cross-departmental coordination mechanisms, clearly define STEM capability objectives and the proportion of Ethics Education elements in talent cultivation plans, and provide specialised funding to support the development of teaching resources. Second, improve teacher development mechanisms by establishing certification

standards for dual-qualified" teachers, implementing joint training programmes between schools and enterprises, requiring teachers to regularly participate in intelligent finance practice projects and Ethics Education training, and hiring industry experts to form interdisciplinary teaching teams, thereby creating a mutually reinforcing mechanism of technical empowerment and value-driven guidance. Through the industry-driven problem-solving-to-practical application" model, we will promote the deep integration of the education chain and industrial chain, providing practical support for the cultivation of composite accounting talent.

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Public Disclaimer

The authors declare no conflict of interest.

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