

Research on the "Four Elements and Four Integrations" Green Finance Talent Cultivation Path in Higher Education Institutions

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Abstract: Serving the national "Dual Carbon" strategy and the development of a financial powerhouse, there is an urgent need to cultivate a new generation of green finance professionals who possess patriotic sentiment, professional expertise, and global competence. Grounded in the fundamental task of "fostering virtue and cultivating talent" within the holistic ideological and political education framework, this paper innovatively constructs a new talent cultivation model for green finance. The model defines its objectives across four dimensions—professional knowledge, practical skills, innovative thinking, and a global perspective (the "Four Elements")—and implements them through four integrated pathways: the fusion of ideological education with professional teaching, interdisciplinary integration, the integration of innovation and education, and industry-education collaboration (the "Four Integrations"). This provides theoretical insights and practical solutions for enhancing the quality and effectiveness of green finance education in the new era.

Keywords: "Dual Carbon" Strategy; Green Finance; Talent Cultivation; Four Elements; Four Integrations

1. Introduction

Against the backdrop of deepening global climate governance and the comprehensive implementation of China's Dual Carbon strategy, green finance has become a core engine driving the green transformation of the economy, safeguarding national financial security, and shaping new advantages in international competition. Talent serves as the primary resource for advancing green finance. However, the structural contradictions currently faced in China's green finance sector are increasingly manifested as a systemic shortage

of high-quality, interdisciplinary professionals. Traditional financial talent cultivation models—in terms of philosophy, content, and methodology—struggle to adequately respond to the profound transformation inherent in green finance: it is not merely the greening of financial instruments and products, but a systematic revolution involving development philosophy, value ethics, knowledge systems, and practical paradigms. Therefore, exploring and constructing a new model for cultivating green finance talent that meets the demands of the new era and embodies Chinese characteristics has become a major and urgent task for higher education in serving national strategies [1].

"Fostering virtue through education" is the fundamental mission of education, providing the highest principle and fundamental guidance for addressing the aforementioned challenges. It requires that value shaping be placed at the core of talent cultivation and integrated throughout the entire process of knowledge impartation and ability development. Currently, green finance education in universities is largely in a preliminary exploratory stage, with significant limitations in the cultivation model, rooted in the lack of systematic and coordinated design between talent development objectives and implementation pathways. Based on this, this paper proposes, with "fostering virtue through education" as its soul, the construction of a new "Four-Element, Four-Integration" model for cultivating green finance talent. This model aims to systematically integrate cultivation objectives and implementation pathways: in terms of objective dimensions, it defines the core competencies as an integrated set of "professional knowledge, practical skills, innovative thinking, and a global perspective" (the "Four Elements"). In terms of implementation pathways, it designs four synergistic approaches: "integration of ideological and professional education,

interdisciplinary integration, integration of innovation and education, and industry-education integration" (the "Four Integrations"). This is intended to provide theoretical reference and practical solutions for promoting the connotative development of green finance education in China and cultivating high-quality innovative talent.

2. Current Status of Green Finance Talent Cultivation in Higher Education Institutions

Under the "Dual Carbon" strategy, Chinese universities have made initial progress in cultivating green finance talent. However, significant challenges persist in the current cultivation system regarding its philosophy, structure, content, and mechanisms, failing to fully meet urgent national strategic needs and the fundamental educational goal. This chapter analyzes these core issues from both strategic design and implementation perspectives to identify barriers and guide the development of an innovative talent cultivation model.

2.1 Preliminary Establishment of the Cultivation System

With green finance being incorporated into the national top-level strategic design, higher education institutions have gradually recognized the strategic value of cultivating green finance talent and have begun to explore the construction of a cultivation system that aligns with market demands [2]. At the level of program design, some pioneering institutions have broken through the framework of traditional finance majors by adding specialized tracks in green finance within programs such as Financial Engineering and Master of Finance, creating targeted talent development pathways. In terms of educational levels, a preliminary multi-tiered cultivation structure connecting undergraduate and master's programs has taken shape. The undergraduate stage focuses on imparting fundamental theories and general knowledge of green finance, while the master's stage concentrates on developing specialized competencies in segmented fields such as green bonds, carbon finance, and environmental risk assessment, attempting to match the differentiated demand for talent at various levels within the green finance market. Furthermore, some vocational colleges have actively followed suit, offering relevant green finance training courses that emphasize the

development of practical operational skills, thereby addressing the gap in the supply of application-oriented skilled personnel within higher education. Together, these efforts constitute the nascent form of a diversified cultivation system.

2.2 Preliminary Exploration of Industry-Education Integration

In response to the highly practical nature of green finance as a discipline, universities have begun proactively engaging with financial institutions and green industry entities to explore industry-education integration as a talent development pathway. On one hand, by establishing cooperative relationships with banks, securities firms, green finance consulting companies, and other institutions to jointly build internship and practical training bases, they provide students with hands-on experience in real business scenarios such as green credit approval, green bond underwriting, and ESG investment analysis. On the other hand, by inviting industry experts into the classroom through special lectures, case study seminars, and other formats, they integrate the latest market dynamics, policy changes, and practical challenges of green finance into the teaching process, effectively bridging the gap between academic instruction and industry practice. Some universities also leverage the policy advantages of Green Finance Reform and Innovation Pilot Zones to participate in regional green finance project research and evaluation work. This allows students to deepen their understanding of the application logic of green financial instruments through practical engagement, initially achieving a positive interaction between "teaching, practice, and industry."

2.3 Gradual Integration of Green Concepts

Some higher education institutions have begun integrating concepts of green development and social responsibility awareness into the green finance talent cultivation process. By interpreting the core essence of the "Dual Carbon" strategy and analyzing the social value of green finance policies within course teaching, they guide students to recognize the important role of green finance in promoting systematic economic and social transformation, thereby strengthening their sense of mission to serve national strategies. Simultaneously, by

organizing social practice activities such as green finance public advocacy campaigns and low-carbon development themed research, they extend ideological and political education from the classroom to extracurricular contexts, fostering students' ecological conservation awareness and sense of social responsibility. This preliminary fusion of ideological-political elements with professional education lays the groundwork for cultivating green finance talent from a "holistic ideological and political education" perspective, aligning with the cultivation requirements for financial talent in the new era, which emphasize "value guidance, competency focus, and knowledge foundation."

3. Problems in Green Finance Talent Cultivation in Higher Education Institutions

Universities, as the primary base for talent cultivation, have initiated preliminary efforts in this area. However, due to factors like disciplinary lag and dynamic industry demands, structural deficiencies persist. This chapter reviews progress in cultivation system building, industry-education integration, and ideological education integration, while examining issues in talent supply, curriculum design, and faculty development. It thus provides a practical basis for constructing the "Four- Elements and Four-Integrations" cultivation model.

3.1 Ambiguous Strategic Positioning of Talent Cultivation

Currently, there is no clear and unified consensus or plan at the strategic level for cultivating green finance talent in higher education institutions. This leads to training practices that are somewhat "fragmented" and "reactive," lacking systematic design and foresight. First, most cultivation programs still focus on imparting "technical" knowledge, such as financial instruments, environmental risk quantification, and carbon market trading, while providing insufficient interpretation of the value core embedded in green finance, such as ecological civilization philosophy. Second, the cultivation objectives across universities are generally homogenized, failing to achieve differentiated positioning and staggered development based on their own disciplinary strengths. Most institutions simply mimic the curriculum of a few leading universities, resulting in highly similar knowledge structures and competency profiles among graduates. This

fails to meet the genuine demand from different segments of the industry chain for various types of interdisciplinary talent, such as "finance + energy," "finance + environment," and "finance + law", leading to a prominent structural imbalance [3].

3.2 Insufficient Knowledge Integration and Disconnection from Practice

The existing curriculum system remains constrained by the framework of traditional finance education, suffering from outdated content, a monolithic structure, and insufficient interdisciplinary integration. In terms of content design, courses predominantly focus on explaining traditional financial theories, with inadequate coverage of cutting-edge topics such as green finance policy frameworks, green bond innovations, carbon financial instruments, and environmental risk assessment. There is also a lack of systematic analysis of practical case studies from domestic and international green finance markets. Structurally, courses lack logical connections, resulting in a "fragmented" teaching pattern that makes it difficult for students to construct a comprehensive knowledge system of green finance. Most critically, the practical teaching component is weak. Although all institutions emphasize practice, high-quality, systematic practical teaching platforms remain scarce [4]. On-campus training is often limited to case analyses or simple software operations, lacking depth. Off-campus internships, due to corporate concerns over business confidentiality or operational complexity, often assign students only peripheral tasks. Jointly built laboratories and innovation centers between universities and enterprises frequently become mere "nameplate bases" due to a lack of sustainable operational models and benefit-sharing mechanisms, failing to achieve deep coupling between talent cultivation and industrial innovation.

3.3 Inadequate Faculty Support

The teaching faculty is the core guarantee for the quality of green finance talent cultivation. Currently, green finance teaching teams in universities generally suffer from insufficient numbers, an imbalanced structure, and weak practical capabilities. In terms of quantity, there is a scarcity of dedicated faculty specializing in green finance teaching and research. Most teachers have transitioned from traditional

finance backgrounds and lack systematic knowledge reserves in green finance. Structurally, the faculty is predominantly composed of theory-focused researchers, with a very low proportion of "dual-qualified" teachers who possess practical industry experience in green finance. This hinders the effective delivery of practical teaching components. Furthermore, given the rapid policy updates and active market innovations in the green finance field, the existing faculty lacks regular channels for knowledge renewal and industry exchange. This makes it difficult to accurately grasp industry development trends, resulting in a disconnect between teaching content and market demands and an inability to cultivate students' practical innovation capabilities.

3.4 Lack of Long-term Mechanisms for Collaborative Education

Although some universities have explored industry-education integration, overall cooperation remains at a superficial level. In terms of collaboration formats, activities predominantly consist of short-term lectures, observational visits, and internships. There is a lack of deeper collaboration, such as jointly developing courses, co-forming teaching teams, or co-designing practical projects, leading to a disconnect between practical teaching content and real business needs. Additionally, there is a lack of stable, institutionalized collaborative platforms and long-term mechanisms [5]. Current cooperation is mostly driven by specific projects or personal relationships, making it temporary and contingent. Once a project ends or key liaisons change, the cooperation may stall. Collaboration tends to remain at superficial levels like lectures and visits, rarely progressing to core aspects such as jointly formulating cultivation standards, developing curricula, or forming teaching teams. This results in weak sustainability for collaborative talent cultivation.

4. The "Four-Element, Four-Integration" Pathway for Cultivating Green Finance Talent

To systematically address the structural challenges in current green finance talent cultivation in universities—such as ambiguous strategic positioning, insufficient knowledge integration, weak faculty support, and a lack of collaborative mechanisms—this chapter, based

on the fundamental task of "fostering virtue through education," constructs a new talent cultivation model. This model is guided by the "Four Elements" of core competencies—"professional knowledge, practical skills, innovative thinking, and a global perspective"—and implemented through the "Four Integrations" pathways—"integration of ideological and professional education, interdisciplinary integration, integration of innovation and education, and industry-education integration."

4.1 Anchoring the "Four Elements" as Core Competencies: Defining the Talent Cultivation Objective System

First, deepening professional knowledge and solidifying the value foundation. During the cultivation process, students must be guided to transcend instrumental rationality and systematically understand the strategic role of green finance in serving ecological civilization construction, promoting systematic economic and social transformation, safeguarding national financial security, and even participating in global governance. This solidifies the value foundation of "finance for good and green for the people," achieving the simultaneous advancement of professional knowledge acquisition and the internalization of value concepts [6].

Second, honing practical skills to align with industry needs. The focus is on cultivating students' applied abilities to solve practical green finance problems. This includes core practical skills such as green project evaluation and environmental risk quantification analysis, green financial product design and pricing, ESG investment and financing strategy formulation, and carbon asset management and trading.

Third, stimulating innovative thinking to lead future development. Green finance is a continuously evolving field, requiring talent with forward-looking vision and breakthrough problem-solving capabilities. It is essential to emphasize cultivating students' keen insight into green finance frontiers, critical thinking abilities for complex problems, and capabilities to innovate in green finance products, models, and mechanisms [7].

Fourth, expanding the global perspective to participate in global governance. Under the framework of global climate change governance, green finance is distinctly international.

Students must be equipped with familiarity with mainstream international green finance standards, rules, and practices, possess cross-cultural communication and cooperation skills, and be capable of effectively engaging in policy, market, and academic dialogues on green finance between China and other countries.

4.2 Implementing the "Four Integrations" Pathways: Synergistically Promoting Cultivation Model Reform

First, deepening the integration of ideological and professional education to strengthen value guidance. The fundamental task of fostering virtue through education is deeply integrated with green finance professional education. Content such as the essence of the "Dual Carbon" strategy, financial ethics, and social responsibility is systematically incorporated into the curriculum system, and a green finance case library with ideological and political education characteristics is developed. By organizing students to participate in green finance public service practices and conduct regional green transformation research, students deepen their recognition of professional value and mission through hands-on practice in serving national strategies and social needs.

Second, promoting interdisciplinary integration to reconstruct the knowledge system. Disciplinary barriers are broken down to construct a "finance + X" interdisciplinary knowledge system that supports the deepening of professional knowledge and the stimulation of innovative thinking. In terms of curriculum reconstruction, a three-tier architecture of "foundation layer - core layer - cross-cutting layer" is designed. The foundation layer strengthens traditional financial theory, the core layer covers cutting-edge green finance content, and the cross-cutting layer offers interdisciplinary courses. Regarding platform development, cross-school collaboration mechanisms are established, interdisciplinary teaching teams are formed, research platforms are built, and interdisciplinary academic activities are organized to facilitate the integration of multidisciplinary knowledge.

Third, strengthening the integration of innovation and education to empower innovative practice. Innovation and entrepreneurship education is embedded throughout the cultivation process to address the issues of weak practice and insufficient

innovation, thereby enhancing practical skills and innovative thinking. In terms of curriculum and teaching innovation, green finance innovation courses are added, employing methods such as case-based teaching and project-based learning. Models like the flipped classroom are introduced to guide students in innovative design. Regarding the practice and competition system, a green finance innovation training center is established, off-campus innovation and entrepreneurship platforms are set up, and a tiered competition system spanning "university, provincial, and national" levels is constructed, forming a virtuous cycle of "teaching-training-competition-incubation." Fourth, solidifying industry-education integration to bridge the supply-demand gap. With deep collaboration at its core, long-term university-enterprise mechanisms are established to enhance practical skills and broaden the global perspective. To deepen collaboration levels, universities and enterprises are encouraged to jointly develop courses and teaching materials, co-form "dual-qualified" teaching teams, and co-design practical projects and internship bases. Models such as "rotational internships and mission-critical project assignment" are adopted to achieve deep coupling between teaching and industry [8]. In building long-term mechanisms, a talent cultivation steering committee is established, long-term strategic cooperation agreements are signed, and leveraging pilot zones and cross-border platforms, international cooperation and exchanges are conducted to broaden students' international perspectives.

4.3 Building a Support and Guarantee System to Ensure Effective Model Operation

To ensure the effective implementation of the "Four-Element, Four-Integration" model, a robust support and guarantee system must be concurrently constructed.

First, building a "theory + practice" dual-qualified teaching team [9]. The faculty structure is optimized by introducing full-time and part-time teachers with industry backgrounds, selecting in-house teachers for enterprise secondments and practical training, and establishing mechanisms for mutual appointment and exchange between university and enterprise personnel. Green finance teaching and research teams are established to conduct regular collective lesson preparation,

teaching seminars, and industry research, ensuring the cutting-edge nature and practicality of teaching content.

Second, regarding resource guarantees, increase funding investment in green finance talent cultivation, focusing on supporting interdisciplinary course development, training platform upgrades, faculty training, and innovation and entrepreneurship incubation. Optimize the allocation of teaching resources, strengthen communication and collaboration with industry associations and government departments, seek policy support and resource allocation, and promote the formation of a "government - university - industry - enterprise" quadrilateral resource-sharing mechanism. This provides a solid guarantee for the continuous optimization of the "Four-Element, Four-Integration" cultivation pathway.

Finally, establish a dynamic feedback and continuous improvement mechanism. Construct a multi-dimensional teaching quality monitoring system comprising student evaluations, teacher reflections, industry feedback, and alumni tracking [10]. Regularly assess the achievement of the "Four Elements" competency objectives and the implementation effectiveness of the "Four Integrations" pathways. Based on the evaluation results and industry development trends, iteratively optimize the cultivation objectives, course content, teaching methods, and collaboration mechanisms, forming a closed loop for the continuous improvement of talent cultivation quality.

5. Conclusion

We address the core contradiction of talent shortage in green finance by constructing a new "Four-Element and Four-Integration" talent cultivation model. It aims to resolve the current structural challenges in cultivation, such as insufficient value guidance, rigid disciplinary barriers, and a severe disconnect between education and industry, thereby achieving the organic integration of knowledge, skills, and values. Reforms in higher engineering and business education in the new era must transcend mere knowledge transmission and skill training, deeply embedding the principle of "fostering virtue through education" with national strategic needs. Talent cultivation should shift from "single-point breakthroughs" to "systematic reconstruction," promoting the

deep integration of the education chain, talent chain, industrial chain, and innovation chain through the synergistic design of goals and pathways.

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