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Cultivating Digital Financial Talent: A Framework for Curriculum Reform in the Era of New Quality Productivity

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Abstract: In recent years, the rapid development of the global digital economy has significantly transformed the structure of productivity. In 2023, General Secretary Xi Jinping introduced the concept of "new quality productivity" during his inspection in Heilongjiang, highlighting the importance of promoting technological innovation and restructuring production factors to drive the growth of various industries. As a key sector of the national economy, education is also being reshaped by the digital and intelligent revolution, rendering traditional financial talent training models inadequate for meeting the evolving demands of the industry. The convergence of digital technologies and emerging industries has created an urgent need for cultivating financial professionals equipped with both digital skills and innovative thinking. This paper explores the construction of a talent training system for digital finance professionals that aligns with the demands of digital and intelligent development under the framework of new quality productivity. By thoroughly examining the characteristics of new quality productivity and analyzing the current state of financial education, this paper proposes an innovative educational model aimed at addressing the deficiencies in the current financial talent training system and fostering the high-quality development of the financial industry.
Keywords: New Quality Productivity, Digital-Financial Talen,Talent Training Model

A robust education system is fundamental to a nation's strength, especially in modern society, where education remains a key driver of national progress(Dale*, 2005; Marginson, 2016). In China, the Central Committee of the Communist Party has elevated education to an unprecedented strategic level, positioning it as both a "national priority and party priority." This has led to significant decisions aimed at accelerating educational modernization and building a strong education system. The report of the 20th National Congress of the Communist Party of China highlights that science and technology are the primary productive forces, talent is the primary resource, and innovation is the primary driving force. It emphasizes the implementation of strategies to rejuvenate the country through science and education, strengthen the nation with talent, and pursue innovation-driven development. Notably, the innovation-driven development strategy is positioned as the cornerstone of the national development agenda. Given this context, deeply exploring the cultivation of digital and financial talent within the framework of new quality productivity holds great practical significance for the modernization of higher education and the construction of a robust higher education system in China.

1. The Connotation of New Quality Productivity and Its Implications for Financial Education

1.1The Connotation and Key Characteristics of New Quality Productivity

The concept of "productivity" was first introduced by the French economist François Quesnay in 1757 in his work on Grain Theory. As a core topic in economics, productivity research spans a wide historical range, from classical political economy to modern development economics. Adam Smith (1776) laid the foundation for productivity studies through his exploration of the division of labor and capital accumulation. Later, within the framework of historical materialism, Marx (1867) emphasized the dynamic relationship between productivity and production relations as the fundamental driving force of social development. In the 20th century, the rise of technological revolutions and industrial transformations shifted the focus of productivity research toward technological advancements, human capital, and institutional innovation. In September 2023, General Secretary Xi Jinping introduced the concept of "new quality productivity" during his inspection in Heilongjiang. (Zhang et al., 2024) This concept marks a significant leap in the evolution of productivity(Zheng et al., 2023), primarily driven by technological innovation and supported by new industries and business models(Liu et al., 2023). It emphasizes the quality of production factors and new combinations of these factors, signaling the onset of a new era in social production(Lee et al., 2023). The key characteristics of new quality productivity can be summarized as follows:

Technological Drive. A core characteristic of new-quality productivity is its strong technological drive(Redding, 2023). Powered by cutting-edge technologies such as artificial intelligence, big data, cloud computing, and blockchain, new quality productivity is fueling widespread and profound transformations across industries. In the context of cultivating digital and financial talent, financial education must evolve in step with technological advancements, embedding these technologies into both curricula and teaching methodologies. Financial students must not only gain a solid understanding of fundamental subjects like financial management and accounting but also acquire the ability to process complex financial data using big data analytics and conduct financial analysis through artificial intelligence tools. Moreover, blockchain technology has revolutionized the fields of auditing and financial services, enhancing security and transparency and creating innovative opportunities for financial professionals. The integration of these technologies not only enriches educational content but also equips future financial professionals with the tools necessary to address contemporary economic challenges.

Innovation-Driven Nature. A key feature of new quality productivity is its emphasis on innovation as a driving force(Wang et al., 2025). Through technological and business model innovations, it has significantly disrupted traditional industries, propelling the digital economy to a higher stage of development. In the realm of financial education(Nguyen & Nguyen, 2024), this innovation-driven nature underscores the pressing need for well-rounded talents who not only possess innovative thinking but also actively embrace and effectively utilize new technologies. Given the complexity of the digital economy and its rapidly evolving environment, traditional accounting and financial analysis methods have become insufficient. As a result, digital financial talents must demonstrate strong innovative capabilities to navigate the challenges posed by emerging business models and financial technologies. The rise of new business models, such as Internet finance and the sharing economy, demands that financial professionals not only master traditional financial theories

but also develop comprehensive skills to manage risks and make informed decisions in an innovation-driven ecosystem. Therefore, financial education must integrate innovation-driven development into its educational goals, curriculum design, and practical teaching projects, fostering students' problem-solving abilities through interdisciplinary integration and enhanced innovation practices.

Knowledge-Intensive. New quality productivity emphasizes the critical role of knowledge as a core production factor(Shin, 2024). In today's society, the creation, dissemination, and application of knowledge are central to driving economic growth and social progress(Bilan et al., 2023; Si et al., 2023). In the context of cultivating digital financial talents, the knowledge-intensive nature requires educational systems to excel in knowledge iteration, ensuring the timely integration and dissemination of the latest theories and technological advancements in the financial sector. Unlike traditional financial education models that focus on established knowledge frameworks, the new quality productivity framework tasks financial professionals with the ongoing mission of continuous learning and staying current with industry trends and technological innovations. For instance, the rapid development of fields such as Financial Technology (Fintech) and Regulatory Technology (Regtech) underscores the necessity for financial professionals to possess strong learning capabilities and motivation for continual knowledge updates. Furthermore, this knowledge-intensive characteristic is reflected in the increasing demand for interdisciplinary knowledge systems. Financial students must not only master finance and accounting but also explore fields such as data science, information technology, and legal regulations to better adapt to the dynamic and complex work environments of the future.

Environmental Friendliness. A core aspect of new quality productivity is its focus on dual goals: maximizing economic benefits while placing significant emphasis on environmental protection and the long-term vision of sustainable development. In the context of cultivating digital financial talents(Zhanbayev et al., 2023), the principle of environmental friendliness plays a crucial role. Financial professionals are required not only to master business and economic knowledge but also to deeply understand and apply sustainable development principles in their decision-making processes.(Grigorescu et al., 2023) They must be equipped to make and implement decisions that align with environmental sustainability, even in complex and evolving market conditions. As such, higher expectations are placed on digital financial professionals to make informed financial decisions that adhere to sustainable development objectives. In the future, financial analysis will go beyond traditional profit and cost frameworks, incorporating comprehensive evaluation systems that assess corporate environmental impact, social responsibility, and governance optimization. Consequently, financial students must stay abreast of developments in innovative financial tools, such as green finance and carbon trading markets, to guide and support businesses in achieving both economic gains and environmental protection, fostering a win-win outcome.

1.2 Demand Analysis for Cultivating Digital-Financial Talent

Amid the rapid development of the digital economy, the financial industry is progressively advancing toward a new stage of intelligence and data-driven operations, fundamentally reshaping companies' demand for financial talent. The emergence of the digital intelligence era not only elevates the requirements for traditional financial management and accounting expertise but also underscores the urgent need for financial professionals to

acquire skills in data analysis(Groenewald & Kilag, 2024), technological applications(Petcu et al., 2024), and interdisciplinary integration(Handoyo, 2024). These capabilities are essential for navigating the increasingly complex and dynamic business environment and addressing technological challenges. The following is a detailed analysis of these three key aspects:

Data Analysis Ability. With the explosive growth in global data volumes, data processing and analysis capabilities have become a critical component of core competitiveness in the financial industry. According to authoritative forecasts from the International Data Corporation (IDC), global data volumes are expected to reach 175 zettabytes (ZB) by 2025, representing a 61% increase compared to 2020 levels. In the era of the digital and intelligent economy, the traditional financial analysis framework has undergone significant transformation. It is no longer confined to static financial statement data but now incorporates inputs from unstructured data, real-time dynamic data, and external market information. This evolution has driven companies to increasingly rely on data analysis for strategic planning and gaining market insights. Organizations are utilizing data analysis tools to forecast market trends, analyze consumer behavior patterns, and accurately assess potential financial risks, enabling them to adjust business strategies and respond to market fluctuations with greater agility.

Technical Application Skills. In key sectors such as finance, auditing, and management, technical application skills have become a vital core competency for financial professionals(Anica-Popa et al., 2024). With the deep integration of advanced technologies like big data, artificial intelligence (AI), blockchain, and cloud computing, the financial industry is undergoing unprecedented transformation. The widespread use of AI in areas such as smart finance, audit automation, and enterprise risk management has greatly enhanced companies' operational efficiency and competitiveness. According to a study by Price Waterhouse Coopers (PwC), the adoption of AI is projected to contribute approximately $15.7 trillion to the global economy by 2030, with the financial sector standing out as one of the primary beneficiaries, making its future development particularly promising.

Interdisciplinary Comprehensive Ability. With the rapid expansion of the digital economy, the scope of work in the financial sector has significantly broadened, moving beyond traditional financial and accounting knowledge to require professionals to navigate multiple disciplines and demonstrate comprehensive capabilities(Faulconbridge et al., 2023). In this context, interdisciplinary competence has become a core element in the cultivation of digital financial talent, particularly in key areas such as data science, Financial Technology (Fintech), legal regulations, and business management. Its importance is especially pronounced as financial technology continues to advance. For example, the rise of Fintech has placed higher demands on financial professionals. According to data from Deloitte, over 60% of financial institutions prioritize technical skills, especially in data analysis, programming, and technological innovation, when recruiting financial talent.

2. The Current Status and Challenges of Digital-Financial Talent Training Models

With the rapid advancement of the digital economy, the educational systems within financial institutions are encountering unprecedented challenges. However, the existing financial talent training model remains insufficient in fully addressing the actual market demand for high-end, interdisciplinary professionals.

2.1 Deficiencies in the Curriculum System and Teaching Methods of Financial Institutions

Outdated Course Design. Currently, the curriculum systems of financial higher education institutions remain predominantly focused on traditional theoretical disciplines, such as accounting and financial management(Dumitru et al., 2023), without fully reflecting the practical applications of cutting-edge technologies like big data, artificial intelligence, and blockchain in the financial sector. According to the China Education Development Report (2023), approximately 70% of financial institutions in China prioritize theoretical knowledge transmission in their teaching content, neglecting systematic training that integrates technology. While a few higher education institutions have introduced emerging courses like "Financial Big Data Analysis" and "Fintech" into their curricula, these courses are mostly offered as electives or supplementary subjects and have yet to become core components of the curriculum. This situation severely limits the effective cultivation of students' technical application skills, making it challenging for them to meet the urgent demands for data analysis and technological innovation in the digital finance era.

Disconnection Between Practical Teaching and Theory. Financial higher education institutions often emphasize theoretical instruction; however, significant shortcomings exist in their practical teaching components. Although many universities have established laboratory courses and training centers, the content frequently centers on traditional financial software operations, failing to fully integrate cutting-edge technologies such as big data analysis and AI-based decision-making. This results in a notable gap between students' practical skills and current industry requirements. According to the National Survey Report on Financial Education in Universities (2022), over 65% of universities continue to prioritize traditional areas like financial statement analysis and tax processing in their practical courses, while coverage of emerging fields such as data mining and intelligent risk control remains inadequate. This disconnection between theory and practice hampers students' ability to quickly adapt and meet the growing digital demands of employers upon entering the workforce.

2.2 Limitations in Faculty and Teaching Resources

Insufficient Technical Background of Faculty. Financial higher education institutions encounter significant structural challenges in faculty allocation, with the majority of resources concentrated in traditional areas such as accounting and financial management. Consequently, few instructors possess expertise in cutting-edge technologies like big data and artificial intelligence. This limitation significantly hampers universities' capacity for innovation and their potential to cultivate digital financial talent. According to the Financial Education Development White Paper (2023), over 80% of faculty members in financial institutions have educational backgrounds in finance and management, while the proportion of teachers qualified to instruct in data science and information technology is alarmingly low, accounting for only about 15%. This discrepancy directly highlights the shortage of teaching resources in emerging technology fields, making it challenging for students to receive professional guidance in applying big data and artificial intelligence during their studies, which adversely impacts their overall development in financial analysis and decision-making.

Slow Update of Teaching Resources. In addition to challenges with faculty, financial institutions are experiencing sluggish updates to their teaching resources, failing to keep pace

with rapidly evolving technologies(Almufarreh & Arshad, 2023). Surveys indicate that over 60% of the 50 financial universities nationwide continue to rely on textbooks published five years ago, which are outdated and do not reflect the latest advancements in cutting-edge fields such as big data, artificial intelligence, and blockchain. In contrast, leading international financial institutions like the Massachusetts Institute of Technology (MIT) and the London Business School have proactively integrated practical case studies involving advanced technologies, such as Fintech and intelligent auditing, into their curricula, showcasing a forward-thinking educational approach.

3. Innovative Pathways for the Cultivation Model of Digital Financial Talent from the Perspective of New Quality Productivity

In the context of the vigorous development of new quality productivity, the cultivation of digital financial talent requires significant transformation. As traditional financial education models struggle to keep pace with the rapid advancement of emerging technologies and the market's urgent demand for high-end talent, financial institutions must implement a series of measures to effectively respond to the new challenges presented by the digital economy and the wave of intelligence.

3.1 Curriculum System Reform

Optimization of Curriculum Structure Design. Currently, the financial curriculum system is primarily dominated by traditional fields such as accounting and financial management, with insufficient integration of emerging technologies like big data, artificial intelligence, and blockchain. To enhance students' career competitiveness, it is crucial to urgently incorporate these cutting-edge technological elements into the curriculum structure. Educational institutions should introduce big data analysis modules within traditional accounting and finance courses, teaching students to utilize tools like Python and R for efficient processing and analysis of financial data. Notably, authoritative forecasts suggest that the big data analysis market in the financial sector is expected to exceed $10.94 billion by 2025, underscoring the increasing market demand for financial professionals with data analysis skills. Therefore, it is imperative to adjust the curriculum structure to ensure that students not only master fundamental financial knowledge but also acquire the ability to leverage big data and AI technologies in financial management and auditing, thereby making this a core focus of financial education reform.

Interdisciplinary Integration. Given the rapid advancement of digitalization, a knowledge system based solely on a single financial discipline can no longer adequately address the complex demands of the modern business environment. Therefore, financial institutions should actively promote interdisciplinary integration, seamlessly combining finance with computer science, statistics, management, and other fields to create a comprehensive cross-disciplinary knowledge system(Allioui & Mourdi, 2023). This initiative aims to enhance students' technical application skills and develop the comprehensive abilities needed to navigate complex business environments. For instance, the Wharton School at the University of Pennsylvania offers a course on "Fintech and Blockchain," which exemplifies the deep integration of finance, technology, law, and other disciplines. According to the Global Financial Education Report (2023), more than half of the top financial institutions have incorporated interdisciplinary modules into their course designs, enabling students to

adapt more flexibly to the rapid development trends in modern financial technology and the digital economy through interdisciplinary learning.

3.2 Strengthening Practical Teaching

Collaboration between Schools and Enterprises plays a crucial role in promoting the cultivation of digital financial talent. By strengthening deep cooperation with enterprises, financial institutions can establish "school-enterprise joint training bases," providing students with platforms for internships and project practice in real industry settings. For instance, Renmin University of China has partnered with Alibaba to create an "Intelligent Finance Laboratory," offering students direct access to cutting-edge data and technology resources in the industry. According to the 2022 National College School-Enterprise Cooperation Report, students participating in school-enterprise internship programs have an employment rate that is 18% higher than that of their peers who did not partake in internships. These internship and project collaboration mechanisms not only assist students in effectively transforming their theoretical knowledge into practical problem-solving skills but also significantly enhance their professional capabilities, innovative thinking, and competitiveness in the job market.

Implementation and Application of Virtual Simulation Technology. With the continuous advancement of virtual simulation technology, financial institutions should actively adopt this innovation to replicate real operational scenarios in financial management, auditing, and corporate decision-making, aiming to enhance students' practical skills and innovative thinking abilities. This technology enables students to practice operations in a simulated financial environment, allowing them to experience actual business processes and gain valuable experience in addressing complex financial issues. According to a study by Deloitte, students who undergo financial training using virtual simulation technology exhibit a 25% significant increase in decision-making accuracy, and their ability to navigate complex financial environments in real work situations improves noticeably. Therefore, the introduction of virtual simulation technology not only provides students with a more diverse practical platform but also plays a crucial role in cultivating their innovative thinking and adaptability in real-world situations.

3.3 Enhancement of Faculty Strength and Teaching Environment

Teacher Training. A teacher's instructional ability directly influences students' learning outcomes, and in the context of digitalization and intelligence, it is particularly crucial for educators to possess the skills to apply cutting-edge technologies. Financial institutions should provide regular training for teachers on emerging technologies such as big data and artificial intelligence, encouraging them to engage in interdisciplinary research and technological practices. For instance, Tsinghua University offers over 100 hours of annual training in big data and artificial intelligence through its "Digital Finance Teacher Training Program," significantly enhancing teachers' technological literacy. Statistics indicate that teachers who undergo technical training experience a notable increase in teaching satisfaction and student employability. Therefore, by implementing continuous teacher training programs, institutions can improve instructors' overall teaching abilities, ensuring that students receive guidance in the latest technologies.

Comprehensive Upgrade of Teaching Facilities. To enhance the teaching environment in financial institutions, there is an urgent need to update teaching facilities, with a particular emphasis on integrating intelligent teaching platforms to improve the interactivity and

practicality of instruction. The implementation of online learning systems and virtual laboratories enables students to learn and experiment beyond the constraints of time and space, significantly overcoming the limitations of traditional classroom teaching. According to the 2023 Global Education Technology Development Report, higher education institutions that adopt intelligent teaching platforms have observed a notable improvement of 15% to 20% in student learning outcomes. Online learning systems not only allow students to access the latest knowledge and technological advancements in the global financial sector in real-time, but virtual laboratories also help students refine their skills in financial analysis and decision-making by creating highly realistic simulated environments, thereby enhancing their practical innovation capabilities.

4. Implementation Suggestions for the Reform of Digital Financial Talent Cultivation Models

In the context of the continuous emergence of new quality productivity, reforming talent cultivation models in financial higher education institutions has become an imperative mission dictated by the demands of the times amid the wave of the digital economy(Przytuła et al., 2024). To effectively align with the forefront advancements in emerging technologies and the profound shifts in market demand, these institutions must adopt a multidimensional approach. This includes optimizing curriculum design, enhancing policy support, and efficiently allocating educational resources to establish a comprehensive and systematic reform blueprint.

On the one hand, financial higher education institutions should proactively respond to the demands of new quality productivity by meticulously planning and implementing a systematic curriculum reform aimed at deeply integrating data technology with financial education to optimize the existing curriculum framework. Currently, the core of the financial curriculum system remains centered on traditional foundational theories such as financial management and accounting, yet it does not adequately encompass cutting-edge technological fields like big data, artificial intelligence, and blockchain. In light of this situation, financial institutions must closely align with the practical needs of new quality productivity by developing and executing comprehensive curriculum reform plans to ensure that the cultivation of financial talent keeps pace with the times and aligns with advancements in new technologies.

First, financial higher education institutions should incorporate courses such as "Financial Big Data Analysis" and "Financial Technology" to effectively integrate cutting-edge technologies like big data, artificial intelligence, and blockchain into the existing teaching framework. Course design can utilize case analysis methods to guide students in mastering data analysis techniques for practical applications, such as market forecasting and risk assessment. Simultaneously, course content should emphasize training in programming tools (such as Python and R) to enhance students' abilities in data processing and algorithm application. This initiative aims to ensure that students can efficiently navigate complex data and make informed decisions when entering the workforce, thereby addressing the urgent demands of future intelligent financial markets. Furthermore, interdisciplinary integration is a crucial direction for curriculum reform. Financial institutions should actively pursue in-depth collaboration with disciplines such as computer science and data science to jointly develop interdisciplinary course modules. For instance, by merging finance with artificial intelligence

technology, they could introduce a course on "Intelligent Finance" or design a course on "Blockchain and Auditing" to deepen students' understanding of the specific applications of new technologies in financial auditing. Through interdisciplinary teaching methods, the goal is to cultivate students' comprehensive qualities, enabling them to demonstrate innovative thinking and adaptability in the rapidly evolving digital economy.

On the other hand, government and educational departments should enhance policy support and financial investment for financial institutions to ensure the effective implementation of curriculum updates and faculty training. The reform and development of financial institutions cannot be achieved solely through the efforts of the institutions themselves; they urgently require policy guidance and financial backing from governmental and educational entities(O'Connor, 2013).

First, the government should formulate and implement a series of policies and regulations aimed at motivating and guiding financial institutions to actively promote curriculum reform in alignment with the actual needs of new quality productivity. It should issue clear educational policy documents requiring financial institutions to increase the proportion of courses on cutting-edge technologies, such as big data and artificial intelligence, in their curricula, thereby facilitating the updating of teaching content and the innovation of teaching methods in universities. Additionally, the government should establish special funds to support financial institutions in acquiring advanced teaching resources and technological equipment, enhancing students' practical skills and improving the overall teaching experience. For example, in the United States, the federal government has effectively aided the development of new courses and the upgrading of educational facilities at various universities through the establishment of an "Educational Technology Innovation Fund," significantly enhancing universities' technological capabilities and the quality of talent cultivation. Second, the government should strengthen training and incentives for teaching staff further. As a core driving force behind educational reform, the quality and capability of educators are crucial. Therefore, the government and educational authorities should regularly provide professional training opportunities for teachers, particularly in fields such as big data analysis, artificial intelligence, and other advanced technologies. According to the 2022 Report on the Development of University Teachers in China, over half of university teachers currently report a lack of professional technical training opportunities, which somewhat restricts their ability to apply technology in teaching. To address this, the government and educational departments should provide necessary financial support and establish a "Financial Teacher Technology Training Program" to help educators acquire the latest technical knowledge and practical skills, ensuring they can effectively carry out the teaching tasks associated with new courses. Furthermore, the government should actively promote deep cooperation between universities and enterprises through policy support to accelerate the integration of industry, academia, and research. It can introduce relevant policies to encourage financial institutions to establish long-term, stable partnerships with technology companies, collaboratively developing teaching content and practical projects related to emerging technologies. For instance, the government can encourage universities to partner with technology companies to create "Innovation Labs," providing students with richer practical opportunities and deeper learning experiences through shared data resources and technology platforms.

References

Allioui, H., & Mourdi, Y. (2023). Exploring the full potentials of IoT for better financial growth and stability: A comprehensive survey. *Sensors*, *23*(19), 8015. https://doi.org/10.3390/s23198015

Anica-Popa, I.-F., Vrîncianu, M., Anica-Popa, L.-E., Cișmașu, I.-D., & Tudor, C.-G. (2024). Framework for integrating generative AI in developing competencies for accounting and audit professionals. *Electronics*, *13*(13), 2621. https://doi.org/10.3390/electronics13132621

Bilan, Y., Oliinyk, O., Mishchuk, H., & Skare, M. (2023). Impact of information and communications technology on the development and use of knowledge. *Technological Forecasting and Social Change*, *191*, 122519. https://doi.org/10.1016/j.techfore.2023.122519

Dale*, R. (2005). Globalisation, knowledge economy and comparative education. *Comparative education*, *41*(2), 117-149. https://doi.org/10.1080/03050060500150906

Dumitru, D., Minciu, M., Mihaila, R. A., Livinti, R., & Paduraru, M. E. (2023). Experimental Programs of Critical Thinking Enhancement: A Worked-Based, Blended Learning Higher Education Curriculum for Economics. *Education Sciences*, *13*(10), 1031. https://doi.org/10.3390/educsci13101031

Faulconbridge, J., Sarwar, A., & Spring, M. (2023). How professionals adapt to artificial intelligence: The role of intertwined boundary work. *Journal of Management Studies*. https://doi.org/10.1111/joms.12936

Grigorescu, A., Munteanu, I., Dumitrica, C.-D., & Lincaru, C. (2023). Development of a Green Competency Matrix Based on Civil Servants' Perception of Sustainable Development Expertise. *Sustainability*, *15*(18), 13913. https://doi.org/10.3390/su151813913

Handoyo, S. (2024). Evolving paradigms in accounting education: A bibliometric study on the impact of information technology. *The International Journal of Management Education*, *22*(3), 100998. https://doi.org/10.1016/j.ijme.2024.100998

Lee, C.-C., Zhong, Q., Wen, H., & Song, Q. (2023). Blessing or curse: How does sustainable development policy affect total factor productivity of energy-intensive enterprises? *Socio-Economic Planning Sciences*, *89*, 101709. https://doi.org/10.1016/j.seps.2023.101709

Liu, H., Zhao, H., & Li, S. (2023). Future social change of manufacturing and service industries: Service-oriented manufacturing under the integration of innovation-flows drive. *Technological Forecasting and Social Change*, *196*, 122808. https://doi.org/10.1016/j.techfore.2023.122808

Marginson, S. (2016). The worldwide trend to high participation higher education: Dynamics of social stratification in inclusive systems. *Higher education*, *72*, 413-434. https://doi.org/10.1007/s10734-016-0016-x

Nguyen, P. N.-D., & Nguyen, H. H. (2024). Unveiling the link between digital entrepreneurship education and intention among university students in an emerging economy. *Technological Forecasting and Social Change*, *203*, 123330. https://doi.org/10.1016/j.techfore.2024.123330

O'Connor, A. (2013). A conceptual framework for entrepreneurship education policy: Meeting government and economic purposes. *Journal of business venturing*, *28*(4), 546-563. https://doi.org/10.1016/j.jbusvent.2012.07.003

Redding, G. (2023). Societal knowledge quality as catalyst for the competitive productivity of technology: One in a set of several universal processes in trajectories of societal progress. *International Business Review*, *32*(6), 102096. https://doi.org/10.1016/j.ibusrev.2022.102096

Shin, Y. J. (2024). Identifying the Role of Knowledge-Intensive Business Services in the Korean Economy as a Sustainable Innovation Tool Using Input–Output Analysis. *Sustainability*, *16*(5), 1823. https://doi.org/10.3390/su16051823

Si, S., Hall, J., Suddaby, R., Ahlstrom, D., & Wei, J. (2023). Technology, entrepreneurship, innovation and social change in digital economics. *Technovation*, *119*, 102484. https://doi.org/10.1016/j.technovation.2022.102484

Wang, J., Qiao, L., Zhu, G., Di, K., & Zhang, X. (2025). Research on the driving factors and impact mechanisms of green new quality productive forces in high-tech retail enterprises under China's Dual Carbon Goals. *Journal of Retailing and Consumer Services*, *82*, 104092. https://doi.org/10.1016/j.jretconser.2024.104092

Zhang, J., Shan, Y., Jiang, S., Xin, B., Miao, Y., & Zhang, Y. (2024). Study on the coordinated development degree of new quality productivity and manufacturing carbon emission efficiency in provincial regions of China. *Environment, Development and Sustainability*, 1-35. https://doi.org/10.1007/s10668-024-05321-x

Zheng, F., Li, Y., Jian, Z., & Lu, R. (2023). Industrial productivity dilemma in management and economics: Retrospect and prospect. *International Journal of Management Reviews*, *25*(4), 666-686. https://doi.org/10.1111/ijmr.12327

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