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Internal Logic and Practical Path of Education, Science and Technology, and Talent Enabling New Quality Productivity

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Abstract:

To promote the high-quality development of Chinese society, the current General Secretary of the Chinese Communist Party put forward the concept of new quality productivity, whose main features are centered on three aspects: "innovation-led", "science and technology-driven" and "talent-led". From the connotation of new quality productivity, its "new quality" is organically linked to education, science and technology, and talents, and in the three aspects of high quality, high level, and high quality, for the empowerment of new quality productivity clear internal logic. Therefore, in accordance with the development requirements of the new quality of productive forces, education, science and technology, talent empowerment of the practical path lies in: deepening the "trinity" to jointly promote the "concept of education"; and strengthening scientific and technological innovation as the lead to promote industrial upgrading; improve the income distribution mechanism to release the talent multiplier effect, which is important for the development of the new quality of productive forces. Release the talent multiplier effect, which is of great significance to writing a new chapter on the great cause of Chinese modernization.

Keywords:

New-quality productivity
Education
Science and technology
Talent

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1. Introduction

Productivity is the most dynamic and revolutionary factor driving social development. To advance Chinese-style modernization, the fundamental approach lies in achieving the modernization of productivity. Consequently, new-quality productivity has become an essential requirement for high-quality development and represents the latest demand for the modernization of productivity. Currently, to effectively utilize new-quality productivity for promoting high-quality

development, efforts should focus on facilitating the smooth flow of various factors into this domain, while promoting the deep integration of education, technology, talent, and new-quality productivity.

2. Analysis of the "new quality" of new-quality productivity

"The core of the concept of new-quality productivity lies in productivity itself, and it falls within the scope of productivity" [1]. The essence of new-quality productivity remains rooted in productivity, with its "new quality" reflecting changes triggered by sufficient quantitative accumulation or theoretical advancements. These "new qualities" represent emerging phenomena that conform to the laws of historical development and signify new directions for growth. In essence, the "new quality" is primarily characterized by innovation-led, technology-driven, and talent-guided features, forming a novel, higher-quality, and more advanced form of productivity.

2.1. Innovation-led view of new productivity

The current General Secretary of the Chinese Communist Party (CCP) emphasized: "Adapting to and guiding the new normal of economic development in our country depends fundamentally on technological innovation to transform growth drivers" [2]. Innovation is an essential attribute of the "new" in new-quality productivity. It is through innovation that traditional productivity achieves a qualitative leap based on quantitative accumulation.

First, new-quality productivity surpasses traditional productivity by innovating its components:

(1) Revolutionizing laborers' quality: In the accelerated progress of modernization, laborers are transitioning from engaging in simple, repetitive, and mechanical physical labor to more complex and creative intellectual labor. With systematic and specialized training, workers in new-quality productivity demonstrate stronger subjective awareness, heightened innovation consciousness, and proficient use of intelligent tools to creatively solve problems.

(2) Innovating labor tools: As the "soul" of production tools, scientific and technological advancements must be continuously accelerated to drive the evolution of tools, which serves as the fundamental driver of new-quality productivity.

(3) Expanding labor objects: New-quality productivity encompasses traditional labor objects as well as those created through scientific and technological innovation, particularly in areas such as renewable energy and big data. These novel objects possess higher functional value, significantly enhancing production efficiency.

Second, new-quality productivity emphasizes innovative combinations of multiple elements. It integrates technological innovation into the allocation of production factors, promoting leaps in the optimization of laborers, tools, and objects. Technological innovation acts as a "booster," enabling effective utilization and configuration of factors within the productivity system. This results in novel combinations of production factors and conditions, facilitating the full release of multifactor productivity, enhancing traditional industrial efficiency, and creating new industries.

2.2. Technology-driven view of new productivity

Science and technology are the primary productive forces. Marx stated that "science is also included in the concept of productivity" [3]. While science and technology exist abstractly, they must permeate other elements of the productivity system to unleash their immense potential and transform into tangible productivity. Advanced technologies empower workers, enhancing their capabilities, and when applied in practice, significantly boost productivity. In doing so, they contribute to the accumulation of knowledge, theoretical innovation, and the advancement of tools and labor objects.

Technological applications not only streamline production processes but also improve management efficiency, reduce waste, and resolve conflicts. By reshaping productivity components and their combinations, technology becomes a powerful driver of new-quality productivity.

Modern science and technology fuel high-quality development with new momentum. The current General Secretary of CCP stressed the importance of innovation, particularly technological innovation, in achieving shifts in growth dynamics. Historical breakthroughs in productivity have been linked to technological advances—e.g., the steam engine in the industrial

age revolutionized industries. In the information era, technologies such as "green," "digital," and "intelligent" innovations, especially in the burgeoning information industry, serve as growth points for upgrading traditional industries and fostering high-quality development. Fully harnessing the high connectivity and penetration of contemporary technologies is crucial for propelling emerging and future industries forward.

2.3. Talent-guided view of new productivity

While the components of new-quality productivity remain similar to those of traditional productivity, modernization introduces new forms, qualities, and characteristics. Among these, laborers— the most dynamic factor—are now highly skilled, digitalized, and proactive, enabling the activation of other productivity elements. Talent is undoubtedly the cornerstone of new-quality productivity.

Talent is the creator, user, and leader of new-quality productivity. At its core, productivity relies on people. It is through their interaction with nature in production activities that productivity emerges. The development of new-quality productivity requires cultivating a pool of skilled talent capable of adapting to digitalized and intelligent production. Compared to traditional productivity, new-quality productivity primarily relies on intellectual laborers and technical workers as revolutionary forces.

As the current General Secretary of CCP highlighted at the talent conference, "We must refine talent management systems, prioritizing talent, trusting, respecting, nurturing, and accommodating them" [4]. Furthermore, the 20th Party Congress Report reaffirmed that "talent is the primary resource," providing a foundational and focal point for developing new-quality productivity. The quality of laborers determines productivity level, and without highly skilled laborers, new-quality productivity cannot emerge. Talent remains the defining factor in the development of new-quality productivity.

3. The internal logic of empowering new-type productivity with education, science, and talent

In a system where education, science, and talent empower new-type productivity, education serves as the foundation, science as the driving force, and talent as the mainstay. Each has its distinct focus as a "primary" element. Recognizing the holistic connections among these factors while understanding the internal logic of their role in empowering new-type productivity is essential for exploring practical paths to this empowerment and laying a solid theoretical foundation.

3.1. High-quality education: The fundamental path to cultivating the subjective elements of new-type productivity

Talent constitutes the subjective element of new-type productivity. The current General Secretary of CCP pointed out in *Out of Poverty*: "The processes of educational development, scientific progress, and economic revitalization are interconnected, sequential, and unified, with education serving as the foundation" [5]. High-quality education is pivotal in cultivating high-caliber talent, making it possible for new-type productivity to drive high-quality development.

High-quality education fosters new-type productivity by reproducing labor power. Labor power, encompassing the physical and mental capacities of laborers, is a critical productive force. Karl Marx noted that "education produces labor power" [6]. Laborers' technical skills determine the level of productivity. A workforce skilled in technology, management, and services provides the intrinsic vitality of new-type productivity. High-quality education not only imparts knowledge but also guides laborers in converting it into productive capabilities. Furthermore, by promoting collaboration between schools, enterprises, and social innovation spaces, education can help transform innovative ideas into practical outputs, advancing the formation and development of new-type productivity.

High-quality education accelerates the upgrading of new-type productivity by expanding workers' knowledge.

First, it shapes workers' values, liberates their minds, and updates their perspectives, enabling the reproduction of new knowledge based on existing frameworks. In the information age, where knowledge grows explosively, workers face challenges such as information overload. High-quality education equips

them to discern valuable information, overcome traditional dependencies, and constantly innovate their knowledge frameworks, fostering creative thinking to drive the growth of new-type productivity.

Second, as a means of reproducing scientific knowledge, high-quality education nurtures scientific innovation capabilities essential for new-type productivity. The ongoing technological and industrial revolutions demand updated talent cultivation plans informed by new-type productivity's developmental needs. High-quality education thus serves as the logical starting point for empowering new-type productivity.

3.2. Advanced science and technology: The key premise for innovating the intermediate elements of new-type productivity

Labor tools are the core elements of productivity, acting as intermediaries between laborers and labor objects. The intermediate elements of new-type productivity remain production tools, which have become more advanced and intelligent with technological progress. High-level science and technology drive the invention and application of advanced tools, promoting the evolution of labor tools toward intelligent systems and laying the groundwork for innovating new-type productivity.

Advanced science and technology enable the leap from quantitative to qualitative change in production tools. Marx stated: "The distinction between economic eras lies not in what is produced but in how it is produced and with what labor tools" [7]. Progress in production tools signifies productivity enhancement and societal advancement. The third industrial revolution brought dramatic changes in social production, ushering in an era of intelligent tools characterized by electronic computing and internet integration. Advanced technology not only frees laborers from physical exertion but also enhances their competencies in various ways. Through advancements in productivity, China is breaking free from technological blockades imposed by Western capitalist nations, further advancing its modernization efforts.

Advanced science and technology propel the invention and application of new forms of labor tools across fields. While Marx acknowledged the role of science and technology in productivity, he offered limited elaboration. History and practice have demonstrated that new-type productivity is fundamentally driven by technological innovation. This involves disruptive innovations that integrate multiple disciplines and fields, sparking industrial transformations, opening new markets, and introducing novel labor tools. Technologies such as quantum computing, brain-like computing, and humanoid robotics exemplify labor tools born from such innovation. Advanced science and technology are thus critical drivers of the transformative changes underpinning new-type productivity.

3.3. High-caliber talent: The core driving force for expanding the objective elements of new-type productivity

The technologically advanced objective elements of new-type productivity comprise its labor objects. High-caliber talent integrates more natural resources into production, and processes and applies them to endow them with labor-object attributes, thereby fostering new-type productivity.

As the primary driving force of new-type productivity, high-caliber talent serves as both the discoverer and user of technologically advanced labor objects. Labor objects encompass unprocessed materials introduced into production. With the advent of the information age and rapid advancements in intelligent technology, high-caliber talent is no longer confined to traditional labor objects. Instead, they leverage AI to uncover new labor objects, such as new energy sources, advanced materials, and abstract big data, broadening the scope of labor objects and enhancing their diversity. By discovering and utilizing previously unknown properties of raw materials during production, talent further accelerates the development of new-type productivity.

High-caliber talent explores emerging fields, opens new markets, and develops industries, thereby transforming them into labor objects that nurture new-type productivity. Disruptive technologies such as the metaverse, generative AI, and future networks are emerging under the leadership of talented individuals. Markets, as unique resources, generate valuable information, which, when analyzed, guides efficient production and prevents resource wastage. This dynamic promotes industrial restructuring and economic transformation to meet evolving societal demands. The

discovery, innovation, and transfer of value from labor objects hinge on high-caliber talent as the core driver. Therefore, high-caliber talent is the intrinsic force accelerating the formation of new-type productivity and serves as its primary resource.

4. Practical pathways for empowering new productivity with education, technology, and talent

Technological innovation relies on talent for propulsion, and talent cultivation depends on education to be realized. "Education, technology, and talent form foundational and strategic support for building a modern socialist nation" [8]. The 20th National Congress of the Communist Party of China for the first time elucidated the intrinsic consistency of coordinated planning and integrated advancement of education, technology, and talent. Therefore, it is crucial to establish a positive cycle among education, technology, and talent to generate a multiplier effect that empowers new productivity.

4.1. Adopting a systematic perspective: deepening the "three-in-one" approach with a broad view of education

The mutual support for the goals of building a strong nation in education, technology, and talent underscores the necessity of integrating and advancing these three elements to enhance quality and efficiency in high-quality development. Hence, in the new era, education must adopt a "three-in-one" broad view to cultivate top-notch innovative talent, scientific leaders, and innovation teams while training vast numbers of high-caliber workers to solidify the foundation for forming and developing new productivity.

First, multi-stakeholder collaboration is essential to foster students' innovative thinking and creativity—currently a shortfall in primary, higher, and vocational education. To meet the demands of high-quality development, all educational entities must address the new requirements posed by the formation of new productivity. This involves providing students with more practical opportunities and open learning environments while focusing on nurturing innovative thinking and creativity. Primary education institutions should compile science-themed books suitable for early education and organize science education activities and training, including innovation contests and exhibitions. Universities must embrace the "main theme" of industry-academic collaborative innovation, enhancing in-depth cooperation with industries. By aligning curriculum systems with the nation's major development strategies and advanced technological fields, higher education institutions can cultivate elite, innovative technological talent proficient in production, management, and services. Vocational education must work on interdisciplinary integration, continuously updating traditional courses to address the evolving technical landscape and embedding the concept of developing new productivity into professional training and career guidance.

Second, updated educational philosophies should enhance students' information technology literacy. Digitalized education serves as a pivotal breakthrough in opening new avenues and building fresh developmental advantages. Schools should offer information technology courses aligned with national digital education initiatives, equipping students with foundational skills in using and understanding tools such as computers, search engines, and social media. They should also instill knowledge of cybersecurity and privacy to better adapt to the demands of new productivity. Companies, enterprises, and institutions in the education market must closely observe how these requirements affect educational demands, anticipate opportunities for projects and products, and supply essential resources. Collaborating with education authorities, they should focus on training exceptional, high-skilled, high-quality talent.

4.2. Emphasizing innovation thinking: leading industrial upgrading through technological innovation

As the engine of new productivity, technological innovation requires industries as carriers and industrial upgrading as a foundation. Therefore, to maturely develop new productivity, sustained iteration and optimization of industrial clusters under the guidance of technological innovation are essential.

Although new productivity is characterized by advanced technologies, it is not confined to a singular mode. As emphasized by the current General Secretary

of CCP, "Developing new productivity does not mean neglecting or abandoning traditional industries" [9]. Traditional industries offer numerous application scenarios and infrastructure for emerging industries. Each region should develop new productivity based on its resource endowments and actual conditions. To enhance innovation capabilities in traditional industries, enterprises should continually recruit practical, experienced talent, optimize structures, and improve the quality and quantity of products. By integrating new production factors such as big data and renewable energy with traditional elements, enterprises can ensure more stable product quality and performance, enabling traditional industries to transform from "manufacturing" to "intelligent manufacturing."

Amid a new wave of technological and industrial transformation, readiness and foresight are crucial. Developing new productivity entails both "upgrading" and "starting anew." Government departments should prioritize creating digital clusters to solidify development conditions for new productivity. Specifically, the central government should select regions with strong digital economic foundations as demonstration zones, implement policies to drive the comprehensive development of core digital economy clusters and promote disruptive technological breakthroughs. These clusters emphasize original and groundbreaking technologies, fostering independent innovation while pursuing intelligent development paths. The entire system must integrate ecological, safety, and economic considerations, achieving higher output with lower energy consumption and carbon emissions. Furthermore, promoting deep integration between industries, regions, and enterprises—regardless of size—can catalyze resource coordination and collaborative innovation. Aiming for intelligent, green, and integrated development, the modern industrial system can propel the advancement of new productivity.

4.3. Maintaining focus: Optimizing income distribution mechanisms to unlock talent's multiplier effect

The qualitative changes in productivity elements stem primarily from the driving force of individuals as producers. Unlike traditional accumulative methods, new productivity requires exploring mechanisms that integrate labor-based distribution with factor-based distribution, ensuring talent, the pivotal multiplier element, fully unleashes its potential vitality.

First, establish an evaluation system for income distribution mechanisms that include knowledge, technology, and innovation, maximizing intrinsic motivation among talent. Measures like refining salary systems, setting up reward funds, and offering career advancement opportunities can invigorate labor, knowledge, technology, and innovation as productive factors while better reflecting their market value. This incentivizes talent to engage proactively in innovation activities. Reforming the scientific and technological evaluation system is crucial for accurately measuring contributions to innovation. Incorporating these contributions into income distribution is essential to respect labor, knowledge, technology, and creativity, fostering vibrant competition among various talents and driving efficient development of new productivity.

Second, foster a supportive talent ecosystem to ensure a conducive external environment for equitable income distribution mechanisms. "When the environment is conducive, talent converges, and success thrives; otherwise, talent disperses, and endeavors fail" [10]. The current General Secretary of CCP's statement underscores the significance of the environment in the talent ecosystem. Building interdisciplinary teams, promoting openness to international talent, and encouraging cross-field collaboration are vital for stimulating creativity. Additionally, societal understanding and tolerance of innovation failure should be promoted to cultivate a culture of open-mindedness. Innovation encouragement funds and start-up capital should support those willing to explore freely, bearing the risks of innovation. Finally, designing fair remuneration and reward systems ensures talent engaged in advancing new productivity receives compensation proportionate to their labor and contributions. This equitable income distribution mechanism fosters a just external environment, continuously energizing the development of new productivity.

5. Conclusion

New productivity represents the CCP's development

and innovation of Marxist production theory, serving as a scientific concept to break through productivity bottlenecks and support high-quality development. In advancing the construction of a strong nation in education, technology, and talent, and in the historical process of realizing the great rejuvenation of the Chinese nation, it is necessary to continuously explore dynamic practices of empowering new productivity through education, technology, and talent. This will help establish a well-coordinated framework to support China's high-quality development.

Disclosure statement

The authors declare no conflict of interest.

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