

Research on the Practical Path of Vocational Education Adapting to New-quality Productive Forces

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Abstract: With the accelerated evolution of the global technological revolution and industrial transformation, new-quality productive forces characterized by digitization, intelligence, and greenness have become a key force in reshaping the economic landscape. The report of the 20th National Congress of China clearly states the need to “focus on improving total factor productivity and enhancing the resilience and security of industrial and supply chains,” which poses urgent requirements for vocational education to serve national strategies and cultivate high-quality technical and skilled talents. Currently, vocational education in China faces practical challenges such as prominent structural contradictions, inadequate industry-education integration, and lagging digital transformation. Based on the connotations and characteristics of new-quality productive forces and combined with the typological orientation of vocational education, this paper systematically analyzes the adaptive transformation path of vocational education from dimensions including specialty construction, curriculum reform, industry-education integration, and faculty development. It aims to provide theoretical support and practical guidance for constructing a modern vocational education system compatible with the development of new-quality productive forces.

Keywords: Vocational education; New-quality productive forces; Practical path

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1. Introduction

New-quality productive forces represent a new form of productive forces, advocating for the vigorous development of strategic emerging industries such as new energy, new materials, artificial intelligence, and electronic information. These forces promote industrial transformation and innovation through scientific and technological innovation, further accelerating the transformation and upgrading of traditional industries, enhancing the international competitiveness of Chinese enterprises, and further improving the country's comprehensive national strength^[1]. The traditional vocational education model is out of sync with the cultivation of innovative and composite talents required by new-quality productive forces, manifesting as low matching

degrees between specialty settings and industrial upgrading, curriculum content lagging behind technological frontiers, and practical teaching systems struggling to support the demands of emerging industries. Against this backdrop, exploring the practical path for vocational education to adapt to new-quality productive forces is not only an important measure to implement the national education reform deployment but also an inevitable choice to promote the high-quality development of vocational education ^[2].

2. Specific requirements for vocational education to adapt to new-quality productive forces

2.1. Vocational colleges are required to comprehensively improve the quality of talent cultivation

To further promote the development of new-quality productive forces, vocational colleges should focus on the development of strategic emerging industries, accurately grasp industrial development trends, optimize discipline settings and talent cultivation models, and facilitate the convergence of industrial development, talent demand, and discipline settings. They should innovate talent cultivation mechanisms, enhance students' scientific spirit, innovation abilities, and critical thinking, and provide talent support for the development of new-quality productive forces. Meanwhile, vocational colleges should strengthen interdisciplinary integration, focus on the cutting edge of science and technology and new economic formats, further advance the construction of new liberal arts and new engineering disciplines, deepen industry-education integration and school-enterprise cooperation, and improve students' professional competence, vocational skills, and innovative spirit, so that they can meet the employment standards of enterprises and provide a talent pool guarantee for accelerating the development of new-quality productive forces ^[3].

2.2. Vocational colleges are required to promote science and technology innovation education

Science and technology innovation is a core element of new-quality productive forces, advocating for disruptive technological innovations, fighting battles to tackle core technologies, further enhancing China's scientific research innovation and competitiveness, and seizing opportunities in the new round of the technological revolution, thereby improving China's core competitiveness. Vocational colleges should comprehensively promote science and technology innovation education. On the one hand, they should adhere to high-level scientific and technological self-reliance and strengthen investment in scientific research projects, encourage academic leaders to participate in scientific research, accelerate core technology breakthroughs, actively apply for invention patents, and accelerate the transformation of scientific research achievements in vocational colleges. On the other hand, vocational colleges should focus on the socialist market economy with Chinese characteristics, pay attention to new economic forms such as the low-altitude economy and the "Internet +" economy, further optimize the teaching models of economics and management majors, increase content related to the digital economy and inclusive economy, enhance the ability of science and technology to support high-quality and green development of the economy and society, and improve the quality of talent cultivation in economics and management majors ^[4].

2.3. Vocational colleges are required to accelerate the transformation of scientific research achievements

The development of new-quality productive forces requires vocational colleges to facilitate the transformation

of scientific research achievements, quickly converting these achievements into social productive forces. This can not only effectively improve enterprise production efficiency and economic benefits, further activate market vitality, but also promote the development of high-tech industries, accelerate the transformation of traditional industries, and foster the development of strategic emerging industries^[5]. Firstly, vocational colleges should base themselves on the needs of new-quality productive forces for industrial development, focus on the demand for industrial talents, pay attention to the development of teachers' scientific research capabilities and the cultivation of students' scientific research and innovative spirit, actively establish scientific research projects, encourage teachers to participate in scientific research projects, promote cooperation between vocational college research teams and enterprises, shorten the transformation cycle of scientific research achievements, and strengthen intellectual property protection. Secondly, vocational colleges should improve the scientific research system, cultivate scientific research projects centering on strategic and pilot industries, facilitate interdisciplinary crossovers, help high-tech enterprises solve technical problems, boost the development of industries such as artificial intelligence and the "Internet +" economy, and lay a solid foundation for the development of new-quality productive forces^[6].

3. The significance of vocational education adapting to new-quality productive forces

3.1. Facilitates deepening the modernization reform of vocational education

New-quality productive forces represent a leap in productivity, integrating elements of a new round of technological revolutions such as artificial intelligence, big data, blockchain, and cloud computing. They accelerate industrial transformation, gradually deriving new forms of productive forces, which invisibly shift enterprise talent demands and bring tremendous impacts on vocational education reforms, thereby facilitating further advancements in vocational education reform^[7]. In the context of new-quality productive forces, vocational colleges should actively engage in digital teaching, construct virtual simulation training systems, intelligent robot training bases, etc., promote interdisciplinary studies, allow students to acquire new technologies such as artificial intelligence, autonomous driving, and intelligent manufacturing in advance, improve the quality of talent cultivation, and provide talent support for driving the development of new-quality productive forces.

3.2. Conducive to cultivating top-notch innovative and scientific research talents

Innovation is the "soul" in the development process of new-quality productive forces, and scientific and technological innovation is the core element in developing new-quality productive forces. Vocational colleges should aim to cultivate top-notch innovative and scientific research talents, transforming vocational colleges into hubs of innovation, further enhancing students' innovation abilities, scientific research abilities, big data application abilities, and artificial intelligence technology application abilities, cultivating more top-notch innovative and scientific research talents for the country, enabling them to stand out in the fierce international competition. At the same time, vocational colleges should comprehensively deepen cooperation with high-tech enterprises, jointly construct an industry-academia-research teaching mode, accelerate the transformation of scientific research achievements, provide enterprises with scientific and technological support, cultivate a batch of outstanding talents with international visions, prominent innovation abilities, and scientific research abilities, improve the quality of talent cultivation in vocational colleges, and fulfill the educational mission of nurturing talents for the country^[8].

4. Practical paths for vocational education to adapt to new-quality productive forces

4.1. Optimize specialty settings based on the development of strategic emerging industries

Vocational colleges should have a deep understanding of the connotations and characteristics of new-quality productive forces, clarify the directions of new rounds of technological revolutions and industrial transformations, flexibly adjust discipline settings and professional course clusters, improve the discipline system, create distinctive specialties, promote interdisciplinary studies and integration, and further enhance the level of education and teaching. Firstly, vocational colleges should clarify the characteristics of strategic emerging industries, center around emerging industries such as artificial intelligence, unmanned aerial vehicle (UAV) research and development, new energy vehicles, intelligent robots, and the “Internet +” economy, adjust the professional course clusters of economics and management, computer science, and mechanical engineering, increase relevant courses on big data, artificial intelligence, and new media, optimize the overall layout of disciplines, support the development of strategic emerging industries, create distinctive specialty clusters, and accelerate the construction of high-quality vocational colleges. For example, vocational colleges can add courses related to big data application and artificial intelligence to economics and management majors, deeply explain the application of new technologies such as big data, cloud computing, and blockchain in fields such as e-commerce and corporate management, further improve the professional course clusters, and enhance students’ innovation abilities and big data application abilities. Secondly, vocational colleges should actively conduct research on the development of emerging industries, increase emerging disciplines, aim to cultivate talents in scientific and technological innovation, and open a batch of new disciplines that meet national strategic needs and the development demands of strategic emerging industries, supporting the development of emerging industries such as the low-altitude economy, biomanufacturing, artificial intelligence, and commercial aerospace^[9].

4.2. Focus on cutting-edge scientific research achievements to enhance students’ innovative and entrepreneurial abilities

Scientific and technological innovation is the core driving force behind the development of new-quality productive forces and an important impetus for promoting the transformation and upgrading of industrial structures. Vocational colleges should actively connect with the frontiers of world science and technology and national strategic needs, increase investments in scientific research projects, encourage academic leaders to conduct scientific research, provide technical support for the development of emerging industries such as biopharmaceuticals, the low-altitude economy, and the “Internet +” economy, further accelerate the transformation of scientific research achievements, help Chinese enterprises improve their market competitiveness, and enhance the international competitiveness of Chinese brands. For example, vocational colleges should base themselves on the development of China’s new energy vehicle industry, actively establish scientific research projects on autonomous driving and lithium batteries, cooperate with automobile enterprises, jointly develop intelligent autonomous driving systems, win key core technology breakthroughs, improve the driving safety of new energy vehicles, thereby enhancing the market competitiveness of Chinese new energy vehicles and helping Chinese enterprises seize overseas markets. In addition, vocational colleges should combine innovation and entrepreneurship with scientific research projects, establish a complete scientific research project management system, select outstanding students to participate in scientific research projects, allowing them to follow mentors and participate in scientific research projects such as UAV research and development, automotive autonomous driving technology, and aerospace material research and development, break through core technology bottlenecks, further enhance students’ innovative and entrepreneurial abilities and scientific research

abilities, encourage them to actively engage in scientific research careers, thereby improving the efficiency of scientific research achievement transformation in vocational colleges and supporting the development of new-quality productive forces ^[10].

4.3. Deepening industry-education integration in an all-round way and constructing the industry-academia-research integration model

Vocational colleges should comprehensively deepen cooperation with technology, manufacturing, and internet enterprises, facilitate the connection between industry, teaching, and scientific research, construct an industry-academia-research integrated teaching model, optimize the allocation of educational and scientific research resources, and further promote the connection between specialized course teaching and emerging industries and cutting-edge scientific research achievements. This allows students to understand the connotation of new-type productive forces during their school years and comprehensively improves the quality of talent cultivation ^[11]. Firstly, vocational colleges should invite enterprise experts to serve as part-time teachers and involve them in teaching, curriculum development, and teaching evaluation within the school. On the one hand, this can promote exchanges between teachers at the school and enterprise experts, enhance teachers' practical abilities, and cultivate "dual-qualified" teachers. On the other hand, school teachers can jointly develop loose-leaf textbooks and digital teaching resource libraries with enterprise experts, incorporating enterprise scientific research achievements and marketing cases into teaching, so that students can acquire job skills in advance. Secondly, colleges and enterprises should jointly establish scientific research projects, strive for enterprise capital investment, solve the problem of scientific research funding in vocational colleges, jointly research and develop the application of artificial intelligence technology in economic fields such as cross-border e-commerce and live streaming sales, develop virtual robots, accelerate the transformation of scientific research achievements, and provide technical support for the cross-border e-commerce and new media marketing industries ^[12].

4.4. Optimizing the talent cultivation model in vocational colleges to cultivate top-notch innovative talents

In the context of new-type productive forces, top-notch innovative talents have become a new demand in corporate hiring. Vocational colleges should actively change their talent cultivation concepts, further optimize their talent cultivation models, integrate new-type productive forces into specialized course teaching and innovation and entrepreneurship education, and further improve the quality of talent cultivation. Vocational colleges should closely follow new trends in technological development and formulate talent cultivation plans centered around economic hotspots and industrial demands, cultivating top-notch innovative talents in industries with urgent needs such as artificial intelligence, "Internet + Economy," and biopharmaceutical manufacturing ^[13]. For example, vocational colleges can adjust the talent cultivation goals of economics and management majors in combination with new economic business forms such as cross-border e-commerce and live streaming sales, carry out practical teaching in areas such as live streaming sales, e-commerce platform operations, and new media marketing, and improve students' big data application and marketing abilities. At the same time, vocational colleges should innovate the teaching evaluation system, utilize big data, cloud computing, etc., to carry out process evaluation, pay attention to students' autonomous learning after class, social practice, and online learning processes, as well as the development of their innovation, scientific research, and practical abilities, thereby promoting their all-round development in morality, intelligence, physique, aesthetics, and labor, and cultivating applied talents who can serve the development of new-type productive forces ^[14].

4.5. Promoting the reform of smart education and improving students' information literacy

Vocational colleges should actively introduce new technologies such as big data, artificial intelligence, virtual simulation, and cloud computing, construct a smart teaching system, build online teaching platforms and virtual simulation training platforms, integrate high-quality internet educational resources into teaching, allow students to experience the convenience brought by smart teaching, and further improve their information literacy and innovation abilities. Firstly, vocational colleges should actively construct virtual simulation training bases to meet the practical teaching needs of majors such as economics and management, machinery manufacturing, and computer science, use virtual robots and VR technology to create virtual situations, deepen students' understanding of artificial intelligence, big data, and VR technology, infiltrate new-type productive forces, and improve students' big data application abilities^[15]. Secondly, schools can introduce professional equipment such as industrial robots and drones to improve the practical teaching environment, facilitate the connection between emerging industries and specialized course teaching, allow students to understand skills such as drone operation and programming, and drone maintenance, make them aware of the concept of low-altitude economic development, and stimulate their enthusiasm for innovation and entrepreneurship. In addition, teachers can lead students to learn industrial robot programming and operating skills, improve their practical operating abilities, deepen their understanding of new-type productive forces, and promote the high-quality development of vocational education.

5. Conclusion

The research on the practical paths for vocational education to adapt to new-type productive forces is not only a profound grasp of the laws governing the development of education, economy, and society but also a strategic choice to promote the high-quality development of vocational education. This study systematically analyzes the connotative characteristics of new-type productive forces and the adaptive changes in vocational education, proposing core paths such as optimizing specialty settings, focusing on cutting-edge scientific research achievements, constructing an industry-academia-research integration model, and promoting the reform of smart education. These paths not only respond to the demand for innovative and interdisciplinary talents from new-type productive forces but also provide feasible solutions for vocational education to address structural contradictions and achieve connotative development.

Disclosure statement

The author declares no conflict of interest.

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