

PERSPECTIVE

Motivations, implementation pathways, and experience insights into India's vocational education reform: An analysis of India's "National Education Policy 2020"

Shangqun Li^{1,2}, Ruizi Zhou^{1,*}¹College of Education, Hunan Agricultural University, Changsha 410128, Hunan Province, China²School of Education, Changde College, Changde 415000, Hunan Province, China**ABSTRACT**

As the primary platform for developing a technical and skilled workforce, vocational education plays a vital role in supporting India's economic transformation and industrial restructuring. The "National Education Policy 2020" issued by India's Ministry of Education aims to align with global trends in vocational education, facilitate economic recovery, and transform the vocational education ecosystem. Specific measures include implementing the National Skills Qualification Framework (NSQF) to improve the quality of the vocational education supply. The policy introduces several key initiatives: the implementation of the NSQF to enhance educational quality and diversify educational pathways to improve accessibility; establishment of collaborative mechanisms between internal and external stakeholders to drive systemic reform; strengthening of vocational training to significantly expand the skilled workforce; and promotion the implementation process of higher vocational education and enhance the social status of vocational education. India's experience in promoting vocational education reform is mainly reflected in the following aspects: strengthening top-level policy design and playing a leading role in policy, improving the introduction system and building a high-quality teaching staff, focusing on the demand for talent and realizing customized supply-demand docking.

Key words: India, vocational education reform, implementation pathways, experience insights

INTRODUCTION

With the exponential advancement of emerging technologies, such as big data, 5G, and artificial intelligence, a paradigm shift has occurred in global talent development requirements. Vocational education has emerged as a cornerstone of comprehensive national development worldwide, serving as a crucial mechanism for strengthening economic capabilities, addressing employment challenges, and fostering social prosperity and stability (Zhu *et al.*, 2023). Consequently, the

modernization of vocational education systems has become a crucial agenda item across nations. In 2018, the United States government enacted the Strengthening Career and Technical Education for the 21st Century Act, implementing a top-level strategic framework that has fundamentally catalyzed the comprehensive innovation and modernization of the American vocational education system. Similarly, in 2020, the Russian Federation Ministry of Education initiated the Professional Education pilot program (Anatolyevna & Vartanovna, 2025), designed to enhance the adaptability

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and quality of vocational education while establishing diverse talent cultivation models tailored to various professional sectors, thereby addressing the critical shortage of technical and skilled personnel. India, one of the world's most populous nations, has faced mounting challenges in human resource development due to the dual impact of the coronavirus disease 2019 (COVID-19) pandemic and market transformation. The escalating shortage of highly skilled and knowledgeable professionals has emerged as a significant impediment to India's socioeconomic development (Zhai & Yuan, 2018).

In response to these challenges, in July 2020, the Indian Ministry of Education promulgated the "National Education Policy 2020", the aim of which is to reform and optimize the country's vocational education system to enhance its quality and improve employment rates (Ministry of Human Resource Development, 2020). Based on India's "National Education Policy 2020" and combined with a number of specific reform initiatives since the policy was issued, this paper analyzes the motivation of the policy, explains its main content and promotion path, and examines the experiences of India's vocational education reform, in order to provide useful reference for the development and reform of China's vocational education in China.

Real motivations for vocational education reform in India

In the context of intensifying globalization and the rapid development of emerging digital technologies, the widespread application of digital technology, the transformation and upgrading of industrial structure, and the steady development of socioeconomy have further increased the demand for skilled labor, consequently exacerbating India's shortage of skilled workers. Meanwhile, India's vocational education system faces challenges, including low public recognition, limited inter-departmental collaboration, and insufficient digitalization (Qu & Sun, 2011). The implementation of a new vocational education policy has become imperative to address the educational challenges of the 21st century, respond to national strategic requirements, and align with the United Nations Sustainable Development Goals.

International factors: aligning with global trends in vocational education development

Modern vocational education plays a crucial role in cultivating high-quality workers and advanced technical skilled talent, facilitating the transfer, diffusion, accumulation, innovation, and practical application of advanced technologies and promoting transformation in production methods and the development of social public services (Wang, 2018). Establishing a modern

vocational education system and nurturing technically skilled talent adapted to global economic transformation and the digital technology revolution has become a core concern shared by countries worldwide, and the trend was particularly pronounced during the COVID-19 pandemic. For example, the Norwegian government increased funding for vocational education, allocating EUR 40 million in batches to help various vocational schools affected by COVID-19, thereby reducing the impact of the pandemic on vocational education (China Education News, 2022). Germany launched the Digital Vocational Skills Education Initiative and vigorously constructed digital infrastructure, creating a digital education and training platform to improve the coverage of vocational skills education and help students obtain more targeted vocational skills training (E, 2021). According to statistics, more than 50% of the population in developed countries have received formal technical and vocational education and training (TVET), while in India, only 2.74% of the working population has received formal TVET (Ministry of Statistics and Programme Implementation, 2020). Under the influence of the international development macro context and overall trends, the implementation of new vocational education policies in India has become an inevitable trend that is in alignment with international social development.

Economic factors: promoting comprehensive socioeconomic recovery

High-quality vocational education and training are the driving forces of economic recovery and the transition to a digital and green economy. Building a future-oriented vocational education and training system has become a key component of economic recovery in the post-COVID-19 epidemic era (European Union, 2020). The COVID-19 pandemic, which swept across the globe, has significantly impacted economies worldwide, with India experiencing sustained economic decline. Between 2019 and 2022, India's economy shrank by 7.30%, and it remains in recession (Wang & Lei, 2021). The pandemic and global environmental changes have weakened India's economic recovery foundation, leading to persistent domestic inflation and further exacerbating fiscal deficit issues. According to the "Overview of Indian Vocational Education", in 2022, employment-age youth (15-24 years) accounted for 18.00% of India's total population; however, only 0.16% received vocational education (UNESCO-UNEVOC, 2022). This indicates a significant disparity between the large proportion of employment-age youth and the small percentage receiving vocational education, resulting in employment-age youth being unable to meet job requirements and leading to a sharp increase in unemployment rates. At the same time, with the rise of the digital technology revolution, India's industrial

structure has undergone further transformation and upgrading, placing new demands on workers' skills and quality levels. For example, numerous traditional retail and logistics employment positions are gradually transforming into technology-intensive and intelligent directions, requiring practitioners to master basic computer skills, data analysis, and other digital and information technology. Therefore, India urgently needs to accelerate its vocational education reform to adapt to global digitalization trends and cultivate the technically skilled workforce needed for socioeconomic development, thereby facilitating steady economic recovery in India.

Internal factors: reshaping the vocational education ecosystem

Since the end of the 20th century, comprehensive education reforms with the theme of "school reconstruction" or "education reconstruction" have emerged around the world, showing synchronous and convergent development characteristics (He, 2006). The vigorous development of vocational skills education and the cultivation of a skilled workforce are key factors driving India's economic development, alleviating unemployment, and achieving the balanced distribution of social resources. However, according to the State of Vocational Education 2020: Technical and Vocational Education and Training data, during India's "12th Five-Year Plan" (2013-2018), less than 5% of the workforce received formal vocational education, compared to 52% in the United States, 75% in Germany, and 96% in South Korea (Ministry of Human Resource Development, 2020). This indicates that India's vocational education penetration rate is significantly lower than that of developed countries, highlighting both the acute shortage of a technically skilled workforce and the urgency of expanding vocational education in India. According to statistics, the demand for technical talent positions in key industries in India will increase by approximately 109 million by 2022 (NaMo App, 2022); The working age population will grow by roughly 9.7 million per annum during 2021-2031 and 4.2 million per annum during 2031-2041 (Press Information Bureau, 2019). This reveals an imbalance between vocational skills training and demographic dividends in India. Data show that in 2018, there were more than 8.5 million Indians living in the Gulf Cooperation Council countries (Li, 2021), indicating that the outflow of a large proportion of skilled talent has led to an exacerbated shortage of skilled labor in the country. The combination of extensive labor outflow and the low proportion of the workforce receiving vocational education and training has stifled India's economic development. In summary, India has long faced a contradiction between supply and demand of vocational education because of enormous

challenges and urgency in relation to its high-quality development. There is a pressing need to reshape the vocational education ecosystem to enhance the technical skill levels of the workforce.

Implementation pathways of vocational education reform in India

Under the guidance of the Skilled India strategy, India's "National Education Policy 2020" has elevated the status of vocational education to an unprecedented level, aiming to achieve the ultimate goal of "ensuring equitable, quality vocational education and lifelong learning opportunities for all by 2030". The Indian government, in collaboration with education departments, relevant educational institutions, and other stakeholders, provides development platforms for vocational education and training. By implementing the National Skills Qualification Framework (NSQF), broadening the types and pathways of education, establishing internal-external coordination mechanisms, strengthening vocational education and training efforts, and promoting the process of vocational education advancement, the government is further improving the vocational education system.

Policy guidance: implementing the NSQF to enhance vocational education quality

The systematic deepening and comprehensive implementation of the NSQF serves as a crucial engine driving the quantum leap in India's vocational education quality. Therefore, in the "National Education Policy 2020", the Indian government not only reemphasized the urgency and importance of advancing the NSQF's full implementation but also indicated that it was a cornerstone for promoting national economic development and industrial upgrading. This framework comprehensively and clearly stipulates the capability standards, qualification certification, and career development pathways for technical skilled talent, aiming to construct a systematic, hierarchical skills certification system to meet different industries' demands for highly skilled personnel. The framework primarily encompasses four aspects. The first helps students actively improve their skill qualification levels according to professional requirements, expanding the scope of communication and learning levels. The second is the skill qualification level system standards. It establishes 10 qualification levels from the 9th grade to the doctoral level, helping vocational education students enhance their employability skills by attaining different qualification levels. The third is the type of skill qualification level. It emphasizes vocational school students' understanding of skill qualification types and their compatibility with their specialties, enables them to develop specialized learning in other professions and skills, and further helps them clarify their professional

preferences and skill requirements. The fourth is skill qualification level learning. This integrates learning content with the curriculum designs of the vocational skills institutions and strengthens integration between the curriculum system and skill practice components, thereby enabling vocational school students to better use their professional strengths and comprehensively take part in practical courses. India's NSQF and vocational education development reinforce each other, enhancing the framework's promotional effectiveness. On the one hand, NSQF achieves goals that are consistent with academic education characteristics; on the other hand, it enables horizontal mobility between general and vocational education.

Furthermore, the Indian government plans to ensure effective implementation of the NSQF through increased funding, the optimization of training systems, and strengthened school-enterprise cooperation. The aim of these measures is to reshape the vocational education ecosystem, improve vocational education supply quality, enhance the international competitiveness of India's workforce, and provide crucial support for sustainable national economic development.

Channel diversification: broadening educational types and pathways to expand vocational education coverage

The vigorous development of vocational education can effectively enhance the comprehensive skill quality of India's employment-age youth, help resolve employment issues, meet the demand for skilled talent in emerging technology industries, and consequently promote steady socioeconomic growth in India. However, while diverse in form, India's current vocational education lacks systematic organization. In response, the "National Education Policy 2020" proposes two educational types to improve the vocational education system and expand its coverage. The first type is formal education, which refers to the various skills and knowledge training conducted by vocational education and training institutions registered with and accredited by relevant national departments. This form of education is primarily delivered through multidisciplinary polytechnics and public industrial training institutes (ITIs), which provide long-term education and training to students. The second type is informal education, which involves learning skills through direct participation and imitation under the guidance of skilled practitioners. These two educational types play crucial roles in meeting different enterprises' hiring needs in the post-pandemic period. According to 2019 statistics, approximately 16 million students were enrolled in ITIs (Ministry of Education, 1970), providing various industries with a substantial workforce that has completed full-phase education and training. At the

macro level, this has promoted India's economic development and enhanced the employment skills of the working population, somewhat alleviating the country's labor shortage issues.

Multi-stakeholder collaboration: establishing internal-external coordination mechanisms to drive vocational education system reform

In response to India's post-pandemic economic development trends and the current state of the vocational education system and institutional development, it is necessary to construct multi-departmental collaboration mechanisms to ensure the efficient operation of vocational education management systems and skill enhancement initiatives. Through organizational safeguards, this promotes the comprehensive improvement of workforce skill levels to effectively address the challenges of intelligent and modern transformation in the post-pandemic context. On the one hand, the government needs to improve the internal quality assurance system. The system's management committee brings together leaders from multiple fields, including representatives from various functional departments, educational elites, renowned experts and scholars, outstanding teachers, and research leaders. Based on the overall guidelines of the national central education plan and closely aligned with post-pandemic technological innovation, economic development, and employment market dynamics across states, this committee collaborates with the National Labor Planning and Employment Office and national administrative departments to formulate vocational education plans that align with local development. On the other hand, the internal quality assurance system has been improved. Supported by the Technical Education Bureau of the Ministry of Human Resources, this system is responsible for planning, guiding, and coordinating national vocational and technical education. The bureau actively seeks cooperation with the Indian Government Planning Commission to jointly develop national vocational and technical education plans and comprehensively supervise and regulate their implementation and progress. Meanwhile, to ensure that the education quality improvement process aligns with these plans, the government should continue to use the whole process monitoring and management system of vocational education.

The coordination mechanism between the internal-external quality assurance systems and the comprehensive vocational education monitoring management system not only meets the requirements for front-end knowledge system assurance in post-pandemic vocational education but also provides institutional support for both the knowledge transmission and skill practice aspects of India's vocational education.

Employer-led initiative: intensifying vocational education and training to substantially cultivate skilled talent

To address the persistent issue of generally low workforce quality resulting from India's long-term capitalist economic policies and to comprehensively enhance workers' skill levels through increased vocational education and training, the "National Education Policy 2020" explicitly encourages employers to actively participate in establishing vocational standards, developing and designing training courses, and providing apprenticeship and corporate employment opportunities. The employer-led vocational education and training model not only provides employment opportunities for workers but also ensures the cultivation of qualified labor that meets job requirements, thereby providing solid support for the labor market. The employer-led vocational education and training model focuses on two main aspects. First, based on the employer-led enterprise-institution cooperation, apprenticeship training models offer flexible internship positions to align with different learning stages and practical needs. At the same time, enterprises strengthen internal training to promote the deep integration of theoretical knowledge and practical operations. This enhances apprentices' professional skills, workplace adaptability, and innovation capabilities, thereby building high-quality talent reserves for the long-term development of enterprises. Second, employers participate in establishing assessment criteria for student academic outcomes. Introducing industry standards and practical requirements ensures close alignment between educational content and practical work, directly or indirectly improving future employees' vocational skills and industry adaptability. Over the past 3 years, companies have contributed over 16.5 billion rupees to vocational education and training sponsorship, significantly supporting vocational education development. The implementation of employer-led vocational education and training helps optimize labor resource allocation and ensures that more vocational students can secure employment after completing their education and training. This plays a crucial role in leveraging demographic dividends and maintaining social stability. This initiative also motivates employers to actively fulfill their corporate social responsibilities, thereby contributing to the building of a sustainable labor market and alleviating workforce shortage pressures.

Breaking barriers: promoting vocational-higher education integration to enhance the social status of vocational education

Indian vocational education has a relatively low status and lacks widespread social recognition, severely limiting its potential as a crucial force for national economic

development and social progress. The deep integration of vocational and higher education is both a historical choice and an important pathway for cultivating high-quality talent that meets digital-era development needs. It is also a key measure for elevating the social status and influence of vocational education. This concept was first proposed by Gandhi in 1937 when he elaborated on the Nai Talim educational principles (Ma & Liu, 2020), subsequently triggering a wave of academic research. The concept of "apprenticeship", formally introduced in India's Eleventh Five-Year Plan (2007-2012), emphasized for the integration of vocational education into secondary and higher education institutions and colleges (Department of Education, 1986). The "National Education Policy 2020" emphasizes that the vertical integration of higher and vocational education is key to improving students' acceptance of the latter. Although higher and vocational education differ fundamentally regarding their training programs, objectives, and content, credits accumulated under unified national standards can be equivalently exchanged. This serves not only as a crucial pathway for enhancing the social recognition of vocational education but also as a fundamental guarantee for promoting integration between vocational and higher education. Currently, several Indian federal governments have implemented proactive measures to foster the integration of higher and vocational education. First, they have expanded educational advancement pathways for vocational school students through agreements between the federal government and universities establishing specialized vocational education programs. These arrangements enable vocational school graduates to directly enter the second year of university studies. Additionally, qualified first- and second-year vocational students receive preferential consideration for admission to vocational bachelor's programs. Second, vocational education has been integrated across all levels of the education system, with bridge courses facilitating vocational school students' transition to higher education. Furthermore, formal bachelor's and master's degree programs have been established to develop systematic vocational competencies and design thinking capabilities. Third, diverse vocational skills training programs have been introduced to enhance students' technical proficiency and professional literacy with the aim of cultivating the highly skilled, knowledgeable workforce that is essential for India's social development.

Experience insights into vocational education reform in India

India's "National Education Policy 2020" has revealed a significant preference for vocational education in both policy and funding, leading to notable achievements in its development. The examination of India's vocational

education reform experience in conjunction with local conditions and global economic development trends can provide new insights regarding the country's vocational education reform and development.

Strengthening top-level design and leveraging policy leadership role

To implement vocational education within general education, the Indian government has, since independence, intensively promulgated dozens of acts, policies, reports, and recommendations. These provide programmatic and guiding action plans for vocational education reform and development, ranging from macro-level aspects, such as financial support, vocational education qualification standards, and an NSQF, to micro-level elements, including talent cultivation models and faculty development (Liu & Liu, 2021).

In terms of skills qualifications, the Indian government, focusing on "leveraging demographic dividends", has successively introduced important documents such as the "National Skills Development Policy" and the NSQF. These comprehensive national skills development strategies effectively address the shortage of skilled talent. These policies have played crucial roles in enhancing workforce skill levels and increasing labor market flexibility and competitiveness. Regarding policy and legislation formulation and implementation, the Indian government has demonstrated forward-looking planning. For example, in 2018, the Indian Parliament revised and formally passed the Skills Development Act. By building a more comprehensive training system and employment service network, this act supplies the business sector with numerous professionally trained talents. This promotes comprehensive development in the skills domain and enhances innovation capabilities, thereby providing solid support for India's economic diversification and transformation. Regarding specific plans, the Indian government has formulated and implemented multiple initiatives to enhance comprehensive skill levels. For instance, the National Apprenticeship Promotion Scheme, launched in August 2016, is one crucial skills development plan (Ministry of Skill Development and Entrepreneurship, 2022). This scheme provides internship opportunities and vocational training for young people through enterprise cooperation, alleviating employment pressure, and improving overall labor market skill levels. In addition, the Indian government has launched other similar skills training programs, such as the Digital India Initiative, to further advance national skills development.

Improving recruitment systems to build high-quality faculty

As a specialized type of education, vocational education has significant gaps regarding financial support compared to other similar educational levels. This lack

of financial support is a key factor contributing to vocational institutions' difficulties in relation to infrastructure improvement, talent recruitment, and research development. High-quality faculty is crucial for India's vocational education development. However, owing to the impact of the COVID-19 pandemic, India's overall economic situation has remained sluggish, leading to certain issues regarding talent recruitment, cultivation, and compensation in vocational education. On the one hand, problems such as job instability, disproportionate worker compensation, delayed wage payments, and lack of social security benefits have had a significantly negative impact on the recruitment of high-quality talent, social recognition, and healthy development for TVET. On the other hand, owing to the current severe shortage of talent in India's TVET industry, the talent demands of the emerging technology sectors are hardly being met. In this regard, relevant Indian scholars have suggested integrating vocational education with school education and carrying out vocational education training, assessment, certification, and internship for students through the two modes of joint training and school education (Wheebox, 2020). At the same time, measures are being taken to improve salary packages for TVET teachers, trainers, and assessors; establish reasonable salary standards; improve social security and welfare systems; and build high-quality teaching staff to achieve healthy and sustainable development in the TVET sector. Furthermore, among other methods, the implementation of lifetime employment systems provides more long-term employment opportunities for training teachers and assessment certification personnel. Such methods broaden talent recruitment standards to meet the urgent demand for vocational subject trainers and provide systematic short-term training for educators who have obtained subject qualifications and wish to engage in vocational technical education, thereby effectively addressing both talent loss issues and supply-demand imbalances in the TVET sector.

Focusing on talent demands to achieve customized supply and demand docking

During the pandemic, Indian industries gradually transitioned from offline to online operations. The vocational education and training sector also witnessed a surge in online training. However, numerous issues exist in India's online vocational education training process and its related systems. On the one hand, weak educational infrastructure severely constrains the widespread promotion of online vocational education training, leading to significant increases in unemployment and underemployment rates across industries, with the greatest impact on low-wage women and rural youth groups. On the other hand, India's existing vocational education training system shows

significant disconnection from contemporary needs, primarily manifested in educational resource scarcity, insufficient practical skills training, and weak alignment with actual industry demands. In response, vocational institutions can offer free vocational training courses targeting vulnerable and special groups, use existing training equipment to the fullest extent, and provide a series of public services to communities, effectively promoting the development of online vocational education training. Furthermore, India has implemented an employer-led vocational education training system that closely aligns with industry demands and provides diverse, multilevel vocational training for the workforce. This system adopts a customized cultivation model that precisely matches industry-required skills, effectively cultivates skilled talent that is highly compatible with industry demands and further promotes India's sustained economic development and industrial upgrading.

CONCLUSION

China's National Vocational Education Reform Plan and India's "National Education Policy 2020" are both government-level strategic plans that share common objectives. Since the promulgation of the "National Education Policy 2020", the Indian government has focused on improving vocational education quality by implementing a series of reform measures that include broadening educational types and pathways, accelerating the vocational-higher education integration process, and enhancing vocational education training efforts. On this foundation, they have constructed a future vocational education model centered on fostering India's economic development by providing strong policy support for the country to leverage its demographic dividends, cultivate skilled talent, and enhance international competitiveness. China now also faces the dual challenges of gradually disappearing demographic dividends and the middle-income trap. Learning from India's experience while achieving complementary advantages and sharing resources with India is key to overcoming these challenges. India's emphasis on strategy-led policy formulation, market demand-oriented skilled talent supply, and industry development-centered vocational education reform provides a valuable reference for China's vocational education development. Meanwhile, the problems exposed during India's vocational education reform process, such as the digital talent shortage and the low recognition of vocational education, present opportunities for exchange and cooperation between China and India. Furthermore, as an important regional country of the Belt and Road initiative, India's development in vocational education has provided a more convenient platform for international exchange and cooperation between China and India. We can take this opportunity to jointly explore

new pathways for vocational education development and to promote in-depth cooperation and mutual prosperity in the field of vocational education.

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