IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Challenges And Opportunities In Indian Vocational Education And Training: A Review

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Abstract: Addressing the skill shortages in the country, enhancing worker employability, meeting industry needs and driving economic growth depend greatly on India's Vocational Education and Training (VET) system. However, this mechanism is not independent of challenges such as economic, social and institutional. This review paper examines the prospects and problems in India's VET system, which is essential for fulfilling the country's changing labour demands. These obstacles reduce the efficiency of VET by creating a mismatch between the skills taught and those that employers require. The National Education Policy (NEP) 2020 seeks to normalise skill-based learning by integrating VET into regular education. India's VET sector may significantly improve its role in creating a competent, flexible workforce that is in line with domestic and international economic demands by tackling these issues. These components have been incorporated in this study to give an in-depth review that will guide future growth plans for the industry.

Index Terms: Indian VET System, Challenges, Public-Private Partnership, National Education Policy 2020, Curriculum Modernisation

Introduction

In the present global economic panorama, a skilled workforce is of paramount importance for the nation's economic prosperity. To create this skilled workforce, vocational education is a pivotal instrument. To sustain in this global competition, the developing countries like India the need for a trained workforce has become more crucial. The economist Adam Smith first highlighted the importance of skill in his book, *The Wealth of Nations* (1776). Fundamentally, Smith believed that the division of labour in specialised fields enhances the skills, efficiency and dexterity of the workers resulting in increased productivity. His observations about the connection between economic success and skill still apply today, especially in vocational education. His seminal work laid the foundation for later theories and highlighted the relationship between human capital and productivity.

Vocational education and training produce individuals with trade-specific skills, practical knowledge and good character in to the market. It is mainly focused on creating skilled personnel that would contribute to the various sectors of the economy and effect economic development. India presently has a youth bulge, as per the Youth in India Report 2022 with a median age of 29, India has one of the youngest populations in the world today. India has several valuable assets but its young population is a force to reckon with. To encash this asset, the right amount of investment in education, health and employment opportunities is required to convert this human resource into human capital. Education is a generally accepted means to accomplish this human capital, which contributes to individual and national growth.

Investment in education and training plays a vital role in economic development and offers individuals expanding returns (Schultz 1961), (Becker, 1964) and (Mincer, 1974). The study by shows that investing in human capital is a wise decision and strong economic systems can be developed in a nation with a skilled and qualified populace. Education impacts a person's consumption and earnings, and investing in people now can affect their future income and activities (Becker, 1962). Higher incomes are directly linked with higher productivity which is obtainable only with good quality of education and efficiently trained labour with good health. The study (Psacharopoulos & Patrinos, 2004) has shown that the returns from human capital are equivalent to those from physical capital.

In this review paper, we have discussed the various perspectives of Indian vocational education and training (VET). We have pointed out the instrumental role of skilled labour in the economic growth of a nation. VET is a key weapon to convert human resources into human capital. We studied the formal education system at its various levels in India. in this paper, we have presented a historical overview beginning from Ancient times to till date and transformative journey of the Indian VET system. We have presented an overview on various governmental schemes. We have presented the current scenario of the VET system with present challenges and opportunities along with subtle suggestions for the policymakers to cope up with the problems and materialise the opportunities present in the Indian VET system.

To encourage vocational training and education in the nation, the government has started a number of programs, including the National Skill Development Mission and the Skill India campaign. Nevertheless, these plans encountered several difficulties during their execution phases. Given the country's economic expansion, there is a huge skills gap between what employers want and what young people learn via school and training in India. Both the employers and the economy at large may be significantly impacted. Since many occupations go unfilled for extended periods of time due to a shortage of competent workers, one of the key issues is the loss of production and income.

Formal Education and its Types in India

Formal education is organised and institutionalised learning in the public and private sectors and with national acknowledgement. Numerous entities and stakeholders (government, educational institutes, teachers, parents and occupants) are involved in the Indian educational system from early childhood to higher education and training, India's formal education system offers a unified and inclusive learning experience by undertaking a structured way through various educational levels. Broadly, two types of education courses are provided 1) general education and 2) vocational education. Under this broadly classified educational system, there are three levels of the Indian educational system: primary education, secondary education and higher education (Bhargavi et al., 2023) which supplement each other.

The first level starts with primary education which includes classes I to VIII, from 6 to 14 years where the first five years of basic reading, writing, numeracy, science, social sciences and languages are taught. Whereas, the next three years' curriculum focuses on the in-depth study of mathematics, science, and social science, languages and the introduction of computers, vocational skills and arts. Education is a subject of the concurrent list but primary education is managed by the Centre, State and Local governments. Under the Right to Education Act 2009, the government of India made primary education free and compulsory for all children, aiming to provide universal access to quality education and lifelong learning. At present, the Gross Enrollment Ratio (GER) of the primary has increased to 104.8% in 2021-22 from 101.3 % in 2018-19 and the GER for upper primary from 87.7% in 2018-19 has risen to 94.7% in 2021-22 as per the Unified District Information System for Education Report (UDISE) 2022.

Secondary education is divided into two parts, one is high school where classes IX and X, from 14 to 16 years are included. During this two-year duration, the curriculum becomes more specialised because students are being prepared for higher education at this stage. It Includes science, mathematics, social sciences, languages and vocational courses. The GER for high secondary has reached 79.6% in 2021-22 from 76.9 % in 2018-19 (UDISE,2022). Another one is senior secondary education, which includes classes XI and XII, from 16 to 18 years. At this level, students have to choose among Science, Commerce and Humanities/ Arts streams, as per their career choices. Students take a national and state board examination under the Central Board of Secondary Education (CBSE), Indian Certificate of Secondary Education (ICSE) and various States Board of School Education (BOSE). The GER for senior secondary has risen from 50.14% in 2018-19 to 57.6% in 2021-

22. As per the (UDISE) Report 2021-22,14.89 lakh schools operate with 95 lakh teachers and 26.52 cr. students are enrolled from primary to higher secondary education in schools. Specialised institutions like Kendriya Vidyalayas available at present are, 1252 in 2021-22 and Jawahar Navodaya Vidayalas in numbers are 643 in 2021-22 to provide better education to specific populations, children of government employees and talented rural students are catered in these schools. The National Education Policy (NEP) 2020, has set a target of 100% GER in school education and aims universalisation of education from the pre-school to the secondary level by 2030.

After completing class XII, the third level is higher education provided by universities, colleges, and institutes. Public and private players are involved It produces undergraduates (UG) with bachelor's degrees of three years, post-graduates (PG) of two-years and research-based doctoral degrees. It also provides academic and professional training in diverse fields, like engineering, medicine and hospitality. Whereas, occupational and technical education and training are provided by industrial training institutes and polytechnics which offer practical skills for job-specific and employment opportunities in trade-specific skills such as welding, plumbing, carpentry and electrical work. Various distance learning platforms are also serving those unable to attend classes regularly e.g. Indira Gandhi National Platform for Open Learning (IGNOU). As per the All India Survey on Higher Education Report 2021-22, presently there are 1,168 Universities, 45,473 Colleges and Stand-Alone Institutes with 12,002 total enrollment of 4.33 crores in 2021-2022 from 4.14 cr. in 2020-21, 4.6% increase is recorded. GER has risen 28.4% in higher education for the age group 18-23 years in 2021-22 from 27.9 in 2020-21. The new policy, 2020 has a target to attain 50% GER in higher education by 2035 for that sake 3.5 cr., seating capacity is to be added in higher education (NEP,2020). These general educational courses, provided by schools, colleges, and universities, help students prepare for vocational education and, connect them indirectly to the market demand for a skilled labour force.

That is why integrating VET with the formal education system is important so that educational outcomes can be aligned with the demands of the labour market. The VET system is essential, particularly in light of the transition of a society from an agrarian to a technologically intelligent society where the need for professionals with intermediate skills is rising. However, a persistent lack of needed skills in the age group of (15-29) exists (NSDC, 2020). In order to address this problem, the Indian government has demonstrated a strong interest in formal VET skill development (Agrawal, 2012), leveraging the enormous potential of a youthful and constantly expanding populace. With its sizable youthful population, India is trying to establish itself as a reliable supplier of skilled labour for the global market particularly for the developed nations with the diminishing labour force and an ageing population, in the rapidly emerging era of a knowledge-driven society. By concentrating on offering high-quality VET in the country can benefit greatly from its large population.

The Historical Overview of Vocational Education and Training in India

VET has been shaping the economic and social structures of the world. Nations benefit from it in terms of employment and economic growth. India has a long history of its VET system. In the ancient period, vocational education was provided to specific varnas according to their trades or occupations. Vocational training was a real-life-oriented application of skills. Under the Varna system, studying economics, algebra, the science of agriculture and cattle farming required for Vaisya, because they were the business class and agriculture, cattle farming and trade occupations were only associated with them (Mishra & Aithal, 2023). This led to the formation of the Guild (Srenis) system over time. Through informal and hands-on training, skills were transferred from one generation to the other generation within specific castes, families and communities. Children of artisans, craftsmen, and traders received apprenticeship training in various trades including carpentry, weaving, metallurgy and pottery. Additionally, Practical training was given at the Gurukuls where students lived with their teachers (Gurus) and the all-round development of students on several arts and crafts, practical skills and religious philosophical education was focused. Vocational education was carried out to meet the demands of society and their needs, such as medicine, architecture, painting, music, veterinary, war, and sculpture (Maheshwari, 2012; Dhall, 2024). Royal families also provided financial cooperation and appreciation to the artisans, craftsmen, musicians and architects. Temples and royal courts were also the places where vocational training was provided.

Very famous and oldest higher education universities such as Taxila/ Takshashila, Nalanda, Vikaramshila and Kanchi University provided formal VET in the ancient period to produce physically, intellectually, and mentally strong future generations. It ensured the transmission of specialised knowledge and skills and

preserved the culture and economy of the period. The Muslim education system was dominant in Medieval India and was mainly focused on religious education nevertheless, technical, professional and vocational education was offered during this era (Ghonge et al., 2020). Based on their interests, talents and capabilities, people started gaining knowledge. And people were employed in various trades at this time, like carpentry, dyeing, handicrafts, and artwork. Furthermore, the trades of silk weaving, dealing in jewellery and precious stones and pottery-making were significant since they required highly qualified workers and sufficient expertise to manufacture quality goods. Several Madrasas and Maktabs were established by Sikandar Lodi in Agra for culture, fine arts and crafts and drew many international pupils. Later it became the hub for art, culture and craft under Akbar's rule (Ghonge et al., 2020). The paintings of that period are famous even today.

During the British period, few efforts were made to introduce technical and vocational training. Their interest arose because they felt the need for roads, canals, bridges, buildings, and railways which led to the establishment of India's first technical institute in 1847, named Thomason College of Civil Engineering now IIT Roorkee. Wood's Dispatch in 1854 highlighted the significance of implementing vocational education in India, presented a comprehensive scheme for primary, secondary and higher education and recommended the formation of three universities Calcutta, Bombay and Madras. In 1857 these universities came into existence. The medium for imparting improved knowledge would be English and vernacular languages. Several craft schools were also introduced to impart skills in trades like carpentry, sculpture, artisans and manufacturing during the 19th and 20th centuries.

In 1882 Sir William Hunter chaired the Indian Education Commission. He presented a document focused on preparing students at the secondary level for vocational and literary education, they can go for the university entrance test and also examined the problems in the education system including occupational and technical education. In 1929 the Hartog Committee and Sapru Enquiry Committee 1934, suggested that boys should also get into vocational courses after class VIII, so there should be a provision for special instructions in technical and industrial education in schools. They also highlighted its role in economic development. The platform for starting diploma-level technical education, the opening of the polytechnic college and Vocational Training College at Delhi were recommended by the Wood Abbot Committee in 1937.

In the post-independence period, India followed the path of industrialisation. The emergence of independent India created possibilities for economic growth, social transformation and democracy which all demanded knowledgeable and competent individuals. The Radhakrishnan Commission 1948, reported that vocational training in agriculture, technology, commerce, engineering and medicine would be important in national programming. At all levels, education is made a priority. The multi-purpose schools were introduced to provide more exposure to the students as per the Mudaliar Commission known as the Secondary Education Commission 1952-53.

The National Education Commission, in 1964-66 (Kothari Commission), advocated a 10+2+3 unified pattern of education in the entire nation. After completing ten years of general education, students can either go for vocational or general education as per student talent. This commission aimed to restructure the entire education system and continuously and sincerely try to provide opportunities to students. Based on the Kothari Commission 1964-66, the National Education Policy (NEP), 1968 emerged. This policy identified that vocational education at the secondary level would be a key player in social transformation. In the developing economy employment opportunities play a crucial role in its growth. To increase employment opportunities, there should be provision of technical and vocational education and diversified educational fields such as trade and commerce, art and crafts, medicine and industry etc.

To use the talents of school dropouts The National Council of Educational Research and Training (NCERT) in 1976 was asked to prepare a vocational education programme (VEP) and help state governments to implement it by the Central Advisory Board of Education (CABE). A working group on vocationalisation of education was formed by the Ministry of Education, Government of India (GOI), which recommended establishing the National Council of Vocational Education and Training (NCVET) and the State Councils of Vocational Education and Training (SCVET) in 1977. The NEP, 1986 ensured a balanced development of technical and occupation specific education through craftsmen training integration. The vocationalisation of education will supply skilful human resources in the labour market results in improved employment.

To achieve rapid and inclusive growth, skill development in the country was supported by the introduction of the National Skill Development Policy in 2009. The policy aimed to provide a high-quality skilled workforce to match the emerging market demand, enhance employability, strengthen competition, and productivity and improve people's living standards. The policy targeted to skill 500 million people by 2022. The National Vocational Qualification Framework (NVQF) was set up to ensure quality and standards at the national level. One of the main features of NVQF is that it provides competency-based qualification and certification based on national and international occupational standards, accreditation, and affiliation to institutes. There is another National Policy on skill development, NSDP 2015 which is concentrated on an outcome-based approach, speeding up the high standard of skill for both youth and employers on a large scale. To promote an entrepreneurial innovative culture, individuals should be empowered with skills which will help to realise their full potential resulting in the economic development of a nation.

The policymakers of the National Education Policy, 2020 re-imagined vocational education. Less than 5% of people are vocationally educated in the age group of 19-24 which is way less than Germany, the UK and South Korea, 75%, 52% and 96% respectively which estimated by the 12th Five Year Plan (2012-17). Vocational education seems inferior to general education which affects students' choices this policy aims to integrate occupation specific education into mainstream education. By 2025, the policy targets to expose 50% of the students to vocational education with the help of schools and the higher education system and to reach the full potential of the Indian youth and to achieve Sustainable Development Goal (SDG) 4.3, 4.4, and 4.5 by 2030. To curtail the dropping out of students, vocational exposure will be provided in middle and secondary schools to every learner. The world is changing rapidly, as are the conditions for knowledge and employment. The improved quality educational opportunities will transform India's future.

Present Landscape of Indian VET System

At Present the Indian VET system is on a transformative journey, considering the changing requirements of the rapidly evolving economy to meet the demand for a skilled and industry-ready workforce, that needs to be supplied into the market to reach the economy's potential growth. With the vision of becoming "The Skill Capital of the World" many initiatives have been undertaken in 2022-23, Indian youth will be provided with high-quality skills that meet the international standards of skilling to become a self-reliant India.

Various schemes have been undertaken by the GOI at the national level. In three phases, the Ministry of Skill Development and Entrepreneurship (MSDE) launched the Pradhan Mantri Kaushal Vikas Yojana (PMKVY 1.0) in 2015. Later this scheme was re-launched on the second and third phases (PMKVY 2.0 in 2016-2020 and PMKVY 3.0 in 2021). The scheme was launched to provide short-term training programmes and encourage and promote skill development and entrepreneurship among youth and industry-related skill training. As per the Skill India portal 2022, this scheme in three phases has trained 1.32 crore youth, provided certificates to 1.10 crore and 24.36 lakh placements took place. Under the Skill India programme, considering the outcomes of the previous three phases PMKVY 4.0 was launched for 2022-26 to fill the skill gap, create a flexible skill ecosystem and address the VET system's existing shortcomings. In India, vocational education and vocational training are provided separately.

In collaboration with State Governments and industry, the Union Budget 2024–25 announced a new nationally supported program as part of the Prime Minister's package. The program intends to modernise 1,000 Industrial Training Institutes (ITIs) and train 20 lakh youngsters in five years. Furthermore, a revision to the Model Skill Loan Scheme announced that 25,000 students will be helped yearly by providing government-backed loans of up to 7.5 lakh. If a student does not qualify for the current schemes, e-vouchers giving an annual interest subvention of 3% for one lakh students per year will be used to finance loans up to 10 lakh for higher education at domestic institutions.

Professional education is a component of higher education, and courses are provided starting from secondary, upper secondary and college level (Pilz & Regel, 2021). Institutions such as polytechnics, nursing and teacher training colleges are examples of higher education institutions that offer vocational diplomas and degrees (Ernsberger, 2016). The government of India calls them stand-alone institutions (AISHE Final Report 2020-21). At the national level, vocational education is regulated by the Ministry of Education (MoE) and the All India Council of Technical Education (AICTE). The responsibilities of quality assurance, curriculum design, planning and development, accreditation, acknowledgement and maintaining standards and norms rely on

AICTE. State-level vocational education programmes are run by comparable authorities, with state-specific names of the departments (Schneider &Pilz, 2019). Under the National Skill Qualification Framework (NSQF), AICTE approves education programmes leading to degrees or diplomas in vocational education.

Vocational training, on the other hand, is controlled by the MSDE, as well as a greater number of state and federal authorities and agencies. The Directorate General of Training, which administers directly the National Skills Training Institutes (NSTI) (formerly known as Advanced Training Institute) and watches over the National Council for Vocational Training (NCVT) (Pilz & Regel, 2021), is the main authority for vocational training at the national level under the MSDE. Both organisations are in charge of learning content and curricula. Authority at the state level named as State Council for Vocational Training (SCVT) manages every day operations of institutions under national guidelines. The states are in charge of implementing improved quality and assurance schemes, administering tests, and distributing additional teacher training. NCVT ensures that training programmes are aligned with industry needs and assist learners in acquiring the necessary skills for their chosen careers (Kaushik, 2014). ITIs, which are run by government and private Industrial Training Centres (ITCs), provide VET. DGT is in charge of vocational training at the higher education level. The Craftsmen Training Scheme (CTS) and the Apprenticeship Training Scheme (ATS) aim to provide training (Rao et al., 2014b).

Craftsmen Training Scheme (CTS)

In order to guarantee a consistent supply of skilled labourers in a variety of trades for the domestic industry, to boost industrial production both quantitatively and qualitatively through systematic training, to reduce unemployment among educated youth by offering employable skills, and to foster in the minds of the younger generation a technical and industrial mindset, the Indian government started this program in 1950.

According to the MSDE 2023 annual report, this is the largest Vocational Training Scheme in the nation. It has been sculpting artisans to fulfil both present and future labour demands through the extensive network of ITIs dispersed throughout the States and Union Territory (Entrepreneurship, n.d.). Depending on the job and course, courses are provided at public or private Industrial Training Institutes (ITIs) that offer training lasting for 6-24 months (Pilz & Regel, 2021). As per the NITI Aayog, 2023, there are a total of 14,789 institutes; public (3194) and private (11595) with a capacity of 25,38,487 seats of ITIs currently affiliated with DGT. While NCVT predetermines the curriculum, SCVT ensures its implementation.

Apprenticeship Training Scheme (ATS)

Apprenticeship training is an interesting blend of vocational instructions and on-the-job training. It's mainly focused on developing skills in those who get enrolled in such schemes. The Apprenticeship Act, 1961 regulates the curriculum, duration of the training, examination, and certification and utilises available industries to provide real-time training to match the requisite of skilled employees in India. The government of India is also emphasizing such programmes. The vision of 'Atma Nirbhar Bharat' and various reforms are undertaken to promote apprenticeship training (MSDE, 2023). According to the National Skill Development and Entrepreneurship, apprenticeship training is helping the Indian young generation to learn needed skills to perform a specific job, get real-time experience in the labour market and earn some amount of money as a stipend. People trained under such programmes have access to more opportunities in all sectors within a country and the rest of the world as well.

The MSDE is the head of the Central Apprenticeship Council (CAC) and directs the Central Government in implementing the Apprenticeship Act, 1961 in India. There are various categories of apprenticeship provided by the MoE and MSDE in India for the duration of 6 months to 3 years for 261 designated trades and 336 optional trades offered by employers as per the requirements. According to the Apprenticeship Act 1961, every employer must get registered on a web portal named apprenticeshipindia.org and call apprentices for apprenticeship programmes in the ratio of 2.5% to 15% of the total workforce including contractual workers also (Directorate of Technical Education Vocational and Industrial Training Himachal Pradesh, Sundernagar, 2021) with an increase in the stipend is provided for training to different trades in 2019. For the year 2022-23, the enrollment under designated trade is 2,20,162 and for Optional trade which is offered by employers, the total enrollment is 4,40,611 trainees (MSDE, 2023).

Polytechnic Colleges

These colleges provide diploma-level technical and vocational education. They play an essential role in the vocational education of India, polytechnic colleges come after Industrial training institutes for having the largest group of colleges (Pilz & Regel, 2021). Their main focus is to develop skills in students and prepare them for particular jobs. Students enrol in these colleges at senior secondary and post-secondary levels to get diplomas which provide a broad range of subjects. The MoE supervises them and is recognised by the All India Council of Technical Education (AICTE). The State Departments of Technical Education at the state level (MoE, 2021) are responsible for administration, supervising the exams and issuing diplomas certificates. These diploma holders have hands-on experience and job-specific skills. Generally, these courses are offered for three years duration in full-time and part-time. To register oneself, the minimum eligibility is the completion of matric and also after completing +2 level schooling even at secondary level depending upon the course. Students who want to pursue higher education after getting a diploma can enter graduation courses for engineering which is a four-year degree, directly in 2nd year for the degree.

Based on the AISHE report, the total number of registered polytechnic colleges is 3,781 recognised by AICTE, and 76.2% and 23.8% of colleges are run by the private and public sectors, respectively. 57.6% of colleges are in rural areas of the country. There are 22,66,516 students enrolled with Stand-Alone Institutions (11,296). These institutes provide diplomas in various courses such as Polytechnic, Teacher Training, Nursing, Paramedical, Hotel Management and Catering and Institute under Ministries (MoE,2021). In 2020, 13,92,031 students were enrolled in polytechnics. Various engineering and non-engineering-based theoretical and practical courses are being provided like civil or mechanical engineering, printing technology, applied crafts, library science, leather technology, sugar technology, garment technology and technical engineering, beauty culture and textile design for women's polytechnic (Goel, 2011). Polytechnic colleges' challenges are not indifferent to the Indian (VET) system; outdated curricula, poor training quality, insufficient funding, unreliable equipment and infrastructure, and staff and teacher qualifications. Also, because of different administrations and responsibilities, there is a lack of uniformity in the quality of knowledge in various States (Schneider & Pilz, 2019).

Challenges for the Indian VET System

The Indian VET system has many economic, social, and institutional challenges that create hurdles in tapping youth's potential for economic growth. The past studies (Schneider & Pilz, 2019), (Chakravarty & Gupta, 2020), (Vats & Malik, 2024), (Saputro et al., 2021) and (Dhall, 2024) highlighted these challenges. To use its demographic dividend, these challenges need to be addressed.

Low Enrollment and Awareness: As stated by the Annual Status of Education Report (ASER) 2023, merely 5.6% of surveyed youth are enrolled in vocational training. As per the National Skill Development Mission, only 2.3% of Indian youth are getting trained formally which is a very small number in contrast to other countries like South Korea with 96%, Japan with 80%, Germany with 75%, the UK with 68% and the USA with 52% (MSDE, 2015). This indicates that people, students and parents are unaware of the advantages of vocational education and training in India (Chakravarty & Gupta, 2020), there is a lack of interest in this field and less social acceptance and the youth are either getting into general education or informal VET system (ASER, 2023). To bring the youth into formal vocational education and training is a challenge to overcome. Active advocacy of vocational education and training is needed, awareness among the youth will be the only way to make skill development inspirational and integration of the informal sector workforce which is approximately 85% with the formal system of vocational instruction and training is the need of the hour. (An Overview of Technical Vocational Education and Training Ecosystem in India, 2020).

Lack of Flexibility and Adaptability: The Indian VET system lacks flexibility and adaptability. In today's competitive world where technology is advancing rapidly, one needs to be flexible and adaptive to this advanced technology so that a country can stay in the competition and meet the evolving workforce demands. Flexibility is the most important element currently lacking in India's VET system. The Indian VET system is concentrated on traditional jobs Indian Skill Report (ISR) 2023. The conventional curriculum is of no use in present times. As per the ISR 2024, the flexibility to modify and update the curriculum regularly guarantees that students have up-to-date knowledge and abilities required to negotiate the changing working fields. This flexibility enables students to face real-time problems in specific jobs.

Not Up-to-date curriculum: VET prepares its outturns for specific jobs and to meet the demand of labour markets. According to (P. Kumar, 2015) an obsolete curriculum is a major obstacle to India's VET system because it does not provide students with industry-relevant skills. This leads to low enrollment in VET courses and increased unemployment among vocational graduates (Buehler et al., 2024). This divergence hinders labour's ability and reduces student engagement. ISR 2024, states modernisation is crucial to improving employability and spurring economic growth, the Nation needs to overcome these challenges by following an up-to-date curriculum. Industry inputs should be involved while updating the curriculum to match the market demand for skills so that vocational courses students should be prepared with presently needed skills, and the invested resources should be tapped with this improved curriculum, policymakers are supposed to go for this improvement in the said area.

Lack of Strong Industry Linkages: Weak industry ties restrict students from having real-world problem-solving attitudes and practical experience. ISR 2023, states that most VET courses operate with little industry engagement, resulting in a disconnection between academic instructions and practical skills necessary to perform a task in a specific job. According to the MSDE Annual Report 2022-23, VET programs lack industry-based apprenticeships, updated curriculum without industry feedback on skill requirements, live projects and structured internships. These are essential for developing skills and problem-solving abilities in industries presently in manufacturing, IT, and healthcare. Deeper involvement is needed on the part of industries and employers to reduce the skill gap deficit, utilise the demographic dividend and not let the invested resources go to waste (Pilz & Regel, 2021).

Low Social Acceptance: One of the significant challenges of the Indian VET system is low societal acceptance. It is seen as less respectable than general degrees. Society prefers traditional higher education which is assumed to provide better employment opportunities and better economic returns to the individuals. This stigma leads to low enrollment (ASER 2023) and a lack of interest in students in vocational courses. This does not stop here, it creates hurdles in getting government funding, policy support and financial assistance to those who are taking these skill development courses which ultimately hinders the economic growth of the nation.

Mismatch in Demand and Supply of Skilled Labour: There is a significant discrepancy between the outturns supplied by the Indian occupational education system and the industry's demand for trained labour (Saputro et al., 2021). This is because vocational institutes are still following outdated curricula that are not aligned with the currently changing demand for skills in the industry. This results in a skill gap deficit and unemployment among vocational graduates (Palmer, 2017). This widening skill gap hinders youth's potential which can otherwise be used in the right direction to drive benefits for the nation's economic growth and to convert labour-intensive into skilled labour-intensive country (Amjad et al., 2005). The Indian Skill Report (ISR) 2023 highlighted that people from urban areas are more in demand than those who got vocational training in rural areas of India because of training differences.

Miscellaneous Challenges: The Indian VET system has several interconnected challenges that affect the quality of vocational instruction. These are related to teachers' qualities as per the MSDE Annual Report 2022-23 and NEP 2020. Teachers lack advanced training and experience relevant to present skills in demand which limits their ability to teach directly. No attention is given to non-technical skills known as soft skills (Sharma & Nagendra, 2016). Further, ISR 2023 states that insufficient infrastructure, insufficient raw materials for hands-on sessions, and outdated machinery to perform practicals hinder vocational training. As noted in the Economic Survey of India 2022-23, students are ill-prepared for real-time problems because more emphasis is given to theoretical knowledge and less to practical experiences, internships and industrial exposure. Additionally, the NSDP 2015 stated that inadequate stipends during internships discourage economically disadvantaged students from participating and learning skills practically. Students from rural areas suffer because metropolitan regions have good facilities which limits rural students' access. To become more inclusive and inspirational, the Indian VET system needs to address these challenges and significant advancements must be made in each area.

Opportunities for the Indian VET System

With the help of public-private partnerships, policy support and digital development, India's VET system offers enormous growth potential. The National Education Policy (NEP) 2020 and other initiatives seek to include vocational education in regular education with globally sought-after industry-aligned programs to increase worker competitiveness and employability.

Returns to Vocational Education: The empirical study conducted by (Chamadia & Mubarik, 2021) revealed that individuals who obtained vocational training according to the industrial demand for skills earned more than those who got academic training. (R. Kumar et al., 2019) observed in their study the effect of vocational training on Individual salaries at the general and sectoral levels. Individuals with formal training earn 4.7% more than those who are not formally trained. The primary sector has the highest impact where individuals with vocational training have a wage increase of 36.9%. Whereas, the wage increase of individuals with formal training engaged in the secondary sector is 17.6%. This demonstrates clearly that formal vocational training has positive economic returns and makes it reasonable to invest resources in the Indian VET system.

Convergence with Industry Needs: According to the ISR 2024, artificial intelligence, information technology, healthcare, manufacturing, and renewable energy are among the industries that are growing rapidly with the expansion of the Indian economy. Several programs are undertaken by the GOI to become a skilled capital. The potential for VET programs to meet the particular skills needed by these industries is highlighted by the MSDE Annual Report 2022-23, ISR 2023, and ISR 2024. By taking industrial input on updating the curriculum of these fields, the employability of VET graduates may be increased and one of the biggest problems of the skill gap deficit can be resolved.

Public Private Partnerships (PPPs): PPPs are considered a significant opportunity for skilling the youth and employment Press Information Bureau (PIB, 2021). To overcome the existing constraints in infrastructure, resources and practical experience, the association between public VET institutes and the private sector is crucial. According to NEP, 2020 such collaborations can enable access to updated equipment, on-the-job training and curriculum modification that meet business demand. The Economic Survey of India 2022-23 pointed out that collaborating with local industries can reduce geographical skill gaps and vocational training should be region-specific to cater to the regional labour market needs. MSDE Annual Report, 2022-23 also emphasized that industry expertise will help to minimize the skill gap and provide investment for under-resourced VET institutes. PPPs have the potential to meet domestic and global industry standards and encash its demographic dividend.

Promote Self-employment and Entrepreneurship: The studies (Carswell & De Neve, 2024)**,** (Choudhury et al., 2024) and (Khan et al., 2024) have highlighted that self-employment requires a broad range of skills like marketing, communication, financial knowledge and support to the people. And people prefer wage jobs over entrepreneurship. As per the claim of NSDC and MSDE Annual Report 2022-23, entrepreneurship courses are added to VET programs. The Government of India is taking various initiatives like the Start-up and Atal Innovation Mission (AIM) to foster this culture of innovation and entrepreneurship. Economic Survey of India 2022-23 stated that entrepreneurship training is essential for economic growth. NEP 2020 is also making an effort to normalize VET and reduce social stigma. Vocationally trained individuals with currently demanded skills can not only create self-employment, but employment for others as well. By following an improved curriculum and extended financial support, entrepreneurship and self-employment have the potential to align with the economic motive of the country.

NEP, 2020 and Policy Support: The Indian VET system lags behind countries like Germany, Japan, the UK, and South Korea. The policy formation and execution of these countries are up to date, able to attract young minds towards these vocational courses and meet the market demands for skills leading to achieving their economic interests. Expanding global outsourcing and NEP 2020 present enormous prospects for the Indian VET system. The policy aims to increase vocational participation to 50% by 2025, bringing it to mainstream education and adaptability to match market demands. NEP 2020 is focused on promoting a skill-oriented culture to align with domestic and international market demand and spreading awareness among students, parents, and society to get rid of the societal stigma attached to vocational instructions and training in India. VET graduates have a wide range of opportunities in industries including IT, customer service and health care.

India is seen as a repository of outsourcing and huge employment opportunities for Indian VET graduates on account of a growing need for skilled labour according to the World Bank.

Conclusion

To sum up, India's Vocational Education and Training (VET) system is at a critical crossroads, with both unique prospects and significant obstacles to assist the country's socioeconomic development. VET's ability to successfully satisfy market demands is hampered by major issues such out-of-date curriculum, insufficient infrastructure, a lack of industry connections, and societal stigma (India Skills Report 2023; NSDC Report). To close these gaps, however, the National Education Policy (NEP) 2020 and programs like the Skill India Mission emphasise more on the development of practical skills and include vocational training on regular basis. Modern technology developments and government-backed public-private partnerships further increase the potential by modernising training programs and increasing access, particularly in rural regions (Economic Survey of India 2022-23). VET programs that are in line with national and international industry standards also create opportunities for workers to join the workforce globally, especially in high-demand industries like manufacturing, healthcare, and information technology. Updated curricula to reflect market trends, increased collaborations with private sector businesses for practical skill development, and increased funding and mentorship support for self-employment initiatives are some suggestions for a forward-thinking VET system (World Bank Report on Skill Development in India). Infrastructure development, business involvement, and sustained policy backing might transform India's VET system into a vibrant, inclusive model that gives its young people the tools they need to succeed in a globalised economy.

VET graduates' long-term results, the influence of public-private partnerships (PPPs), the effectiveness of government programs, and comparisons with global VET models. With many areas that require investigation to improve its efficacy and flexibility, the Indian VET system offers a rich field for future study.

Acknowledgement

I acknowledge the financial support provided by the University Grant Commission (UCG) as a Junior Research Fellowship (JRF- 210510433278)

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