

Analysis of Skill Development in India

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Abstract

There has been an increasing emphasis on skill development and vocational education in India marked by a steady increase of government spending and the broadening of the skill ecosystem in India. Despite this, the unemployment problem remains glaring.

With a total workforce of 476.47 million (World Bank, 2021), it has been shown that only 4.7% had undergone formal skill training in India as against 80% of the workforce of Japan, 52% in the US, 68% in UK, 75% in Germany, and 96% in South Korea (MSDE, GOI, 2015). While it is safe to assume that the share of skilled labour force to India has increased from 2015, it can't be concluded that the addition has been significant.

It is useful to note the changing employment patterns in the economy, with a steady revival of the manufacturing sector, and the attempts at integrating the informal and unorganised sectors which comprise up to 69% of the economy. It was also estimated that 109.73 million workers will be required to sustain the impetus on 22 key manufacturing subsectors by 2022 (British Council, 2016). It was also estimated that an additional 29.8 crore farm workers needed to be skilled (MSDE, GOI, 2015).

This paper aims to understand the growth of skill education in India and the challenges facing skilling and subsequent employability. The study will be based on secondary data analysis published in various reports, policy documents issued by various ministries of Government of India.

Key words: skill development, skill education, vocational training

JEL Classification: I250, I280

1. Introduction

Growth trajectories of all nations are evidences to the fact that quality of human capital is one of the most important drivers of economic growth. Countries that have invested heavily in education and skill development of its population are much ahead in the levels of development.

Human capital is considered the main propeller of growth by many economists. Most of the neo-classical models have been built on the assumptions of diminishing returns to scale, but recent endogenous growth models claim that if healthy, educated and skilled labour is employed with capital and technology, firms will start experiencing increasing returns to scale and the countries will experience many fold increase in growth rates. Available literature suggest role of human capital is crucial to a country's economic growth. There are two dimensions to determine the quality of human capital viz. health and education. This study explores the role of education and skill training for developing human capital. Education and skill training are both important for improving the quality

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Of human capital. Growth of any country not only depends upon the quantity of labour force available, but more importantly on the quality of the labour force (INTERNATIONAL LABOUR OFFICE GENEVA, 2011).

Though the literacy rate has improved considerably in India from 48% in 1991 to 74% in 2018 (macro trends, n.d.), employability after implementation of Skill India Mission in 2014 improved from 38% to 46.2% (India Skills Report, 2022). With a total workforce of 476.47 million (World Bank, 2021) it has been shown that only 4.7% had undergone formal skill training in India as against 80% of the workforce of Japan, 52% in the US, 68% in UK, 75% in Germany, and 96% in South Korea (MSDE, 2015). While it is evident that the share of skilled labour force in India has increased since 2015, it can't be agreed upon that this is anywhere near being significant.

1.1 Need for speeding up skill education in India

India is currently one of the fastest-growing economies in the world, experiencing significant changes in its occupational structures. To sustain an annual growth rate of 8% to 9%, it is essential for the secondary and tertiary sectors to expand at a consistent rate of 10%, especially as agriculture is projected to grow at only 4% annually (Federation of Indian Chambers of Commerce and Industry (FICCI, 2010). If migration continues to grow at the present rate, it will add up to the existing skill gap in the manufacturing and tertiary sector.

By 2030, India is expected to account for 1/3rd of the total labour force in the world. Demand for labour with secondary education has increased in India, but with only 40% capacity utilisation for vocational education in higher secondary grades. Preference has been observed for entering formal education stream over taking vocational courses and not entering labour market. Scope of vocational training remains poor in India as the focus is on narrow specific domains whereas, employer wants labour who is not only trained in domain but is also equipped with soft skills (Amit Dar, 2008). If this trend continues, by 2030, without adequate training for the new workforce, there will be a significant gap between the demand for skilled labour and its supply. This situation highlights the urgent need for reforms in vocational training and education to equip workers with the necessary skills for the 21st century (Chaugule, 2020).

The problem of skilling and employability in India is two-fold. On one hand, there exists a widening gap between the education and skills acquired by youth and the employment opportunities available. On the other hand, there is a significant lack of jobs for those who are trained. In this paper, we shall explore the following:

1. The evolution of education and skill training in India since independence.
2. Analysis of skill ecosystem in India since 2015.
3. The challenges of effective implementation of skill education programmes.

The Paper is organised as follows: following the introduction and objectives, theoretical framework has been introduced. The purpose of presenting the theoretical framework is to strengthen the cause of investing in education and skill development for developing human capital. Next sections briefs on research methodology followed by analysis of evolution of education and skill education in two-time frames viz. pre 2008 and post 2008. The subsequent sections outline the research methodology, followed by an analysis of the evolution of education and skill development across two distinct periods: before 2008 and after 2008. The division of these time frames is significant, as 2008 marked the initiation of the National Skill Development Corporation (NSDC), which aimed to enhance skills in India. The paper then examines the literacy and education landscape in India. After evaluating the

effectiveness of several skill development programs, the document offers recommendations to enhance the delivery mechanisms and implementation of various initiatives.

- **Theoretical Frame Work**

In his "Inquiry", Adam Smith (1776) comments on two aspects of labour viz. quantitative and qualitative. Further emphasising that quality of labour force is developed through education, apprenticeships (Sweetland, 1996). J S Mill (1848) observes human abilities as economic utilities and advocates the role of all activities which lead to development of human abilities. Mill emphasis that it is not only the quality of education and educators that determine the quality of human capital, but stresses upon the role of state and other institutions such as health infrastructure play a very crucial role in building human capital. (Sweetland, 1996). Marshall (1890) defines human capital as personal wealth which comprises of all energies, faculties and habits which develop people industry ready laying emphasis on physical health, education and personal traits as tools of human capital development (Sweetland, 1996). Another important observation made by Jacob Mincer (1958) in his model to examine the personal income inequalities that opportunity cost of time and skill is rewarded with better wages/income (Sweetland, 1996). Gary Becker (1960) acknowledges the role of expenditure in training the human resources in increasing the rate of returns. His study reported that investments in college education provided indirect returns in addition to direct returns (Sweetland, 1996). Schultz (1961) in his work 'Investment in Human capital' observes that a collective effort in the form of organised education, health, on the job training, migration, adult education and training are essential components of human capital development (Theodore W. Schultz, 1961).

A balanced approach towards tertiary education and vocational education is a necessary condition not only to meet the demand and supply side requirements of labour market but also for the balanced growth of all the sectors in the economy (Machin & McNally, 2007).

The relationship between a country's GDP and the quality of its human capital is significant, as the latter is influenced by the innovative capacity and qualifications of its workforce (Curea & Ciora, 2013). In their article "Education and Human Capital Development," Runde et al. (2017) emphasize that access to quality education, skill development, and creativity are crucial for transforming a low-income economy into a middle-income one. (Runde et al., 2017). As India aspires to transition from a low-income to a middle-income economy, it is imperative to address the existing gaps in skill development and access to quality education. By fostering an inclusive and innovative educational environment, India can harness its demographic dividend and pave the way for sustainable economic progress.

- **Research Methodology**

The paper is descriptive in nature and has used secondary data and information gathered from relevant sources in accordance with research needs. This study makes use of pertinent reports, policy documents, articles, papers, and websites from numerous ministry departments and organizations.

- **Skill Eco-system in India**

Skill development ecosystem in India is classified into two categories viz., formal education and vocational education (Konrad Adenauer Stiftung & FICCI, 2015). However, these two domains are treated as distinct entities, leading to a fragmented approach. In contrast, advanced economies have successfully integrated formal and vocational education systems, resulting in highly skilled labour forces. An effective skill ecosystem combines basic literacy and conceptual knowledge with industry-specific training to prepare individuals for the workforce (Ernsberger, 2016). According to ILO

“Education, vocational training and lifelong learning are central pillars of employability, employment of workers and sustainable enterprise development.”

Since the advent of Skill India Mission 2015 conscious efforts are made in India to develop a strong skill ecosystem with clear focus on building competitive advantages, high wages and a strong capacity for innovation. This marks a significant departure from the existing ecosystem which is characterised by low productivity, low wages and poor innovations (Kim Windsor & State Training Services, 2008).

Skill development in India not only is focussing on creating highly employable human resources but also is promoting entrepreneurship through various programmes.

A strong skill eco-system should have a balanced approach towards both demand and supply side of skills, win-win for both employers and employees, strong institutional linkages and mutual interdependence among the agencies both government and private.

Table below consolidates the efforts towards promotion of education and skill education in India:

Table 1: Evolution of Skill Based Education in India

Pre 2008		
Time Period	Initiatives Taken	Description
1947	British Education System	With 12% literacy rate at the time of independence emphasis was on basic education i.e., 3 Rs (Reading, Writing and Arithmetic).
1950	Setting up of First ITI	<ul style="list-style-type: none"> • First Industrial Training Institute (ITI) under the Craftsmen Training Scheme, to impart skills in various vocational trades (disciplines) was established in 1950. • At present there are 14,789 ITIs across the country, of which 3194 are Govt. ITIs and 11,595 are in private sector regulated by Director General of Training. • With 48% seat utilisation ITIs impart long-term vocational training. Skill Training is imparted through Craftsmen Training Scheme and provide employment ready labour to both public and private sector. Uttar Pradesh has the highest number of ITIs. • Around 66% of the total 14789 ITIs, are situated in 5 states i.e. Uttar Pradesh, Rajasthan, Karnataka, Bihar, Madhya Pradesh, and Maharashtra (NITI Aayog, 2023). • ITIs provide training for 126 occupations in total out of which 73 courses are classified as technical, 48 as non-technical and remaining as others.
1956	National Council for Vocational Training (NCVT)	<p>With the advent of second five-year plan and focussed industrialisation in 1956, National Council for Vocational Education was established. Main aim of establishing NCVT was to provide semi-skilled labour force for industries. NCVT presently works as an advisory body to the Government of India to ensure that all ITIs follow guidelines set up by Directorate General of Training (DGT). NCVT is also entrusted with the responsibilities of</p> <ul style="list-style-type: none"> • Prescribing standards and curricula for craftsmen training. • Advising the Government of India on the overall policy and programmes. • Conducting All India Trade Tests and awarding National Trade Certificates.
1961	Apprentices Act	Apprentices Act 1961 aimed at

		<ul style="list-style-type: none"> Bridging the gap between the skills acquired and the skills required to improve competencies and productivity (<i>Acts and Rules Ministry of Skill Development and Entrepreneurship Government of India, n.d.</i>) Creating opportunities and use the facilities available in industry to impart practical training for meeting the requirements of skilled manpower for industry. <p>The Apprenticeship Training Scheme (ATS) provides training in trade and enterprises in optional trades classified in 259 occupations in 39 areas</p>
1964, 1968	Indian Education Commission (Kothari Commission) 1964 National Education Policy 1968	On the recommendations of Kothari Commission (1964) first National Education Policy of India was announced in the year 1968. However, this policy focused on formal education and lacked a clear focus on developing vocational skills. Notable recommendation of this policy for skilling was to provide education for agriculture and industry (<i>NATIONAL POLICY ON EDUCATION 1968 MINISTRY OF EDUCATION-GOVERNMENT OF INDIA, n.d.</i>)
1976	Programme for Vocationalisation of Higher Education	Proposed by National Council of Educational Research and Training (NCERT) was implemented in 10 states and 5 Union Territories with a total intake of 72,000 students (MHRD, 1998).
1986	National Education Policy 1986, Modified Education Policy 1992	Along with policies on Primary, Secondary and higher education, special focus and directions on vocational education was the highlight of this policy. Recognising the gap or mismatch between demand and supply of skilled labour force, this policy stressed the need for providing generic vocational courses at secondary level. Policy recommended an inclusive approach for all sections of the prospective labour force viz. women, handicap people, school drop outs etc. (MHRD, 1998)
Post 2008		
2008	Setting up of National Skill Development Council (NSDC)	NSDC was set up by Ministry of Finance under PPP model to promote skill development by catalysing creation of large, quality and for-profit vocational institutions. Operating on a PPP model. NSDC focuses on to organize, promote, and improve private sector efforts in vocational training while making sure that skill development is not impeded by financial constraints. As the Skill India Mission's strategic implementation and knowledge partner. NSDC concentrate on developing effective training programs that give the future workforce access to a wealth of opportunities in cutting-edge skills.
2009	National Skill Development Policy (NSDP)	Launched by Government of India (GOI) under the aegis of NSDC with the main aims to enhance employability and adaptability of labour to changing technologies, and to attract investment in skill development (GOI, 2009). The areas of focus were <ul style="list-style-type: none"> To enhance the outreach of skill development efforts from 3.1 million persons to 15 million persons annually and to reach 500 million by 2022 To bridge the gap and promote inclusivity between rural/urban, male/female, organised/unorganised, tribal and hill areas etc. To establish coordination among different institutions and ministries offering skill programmes To promote social partnerships in strengthening the skill ecosystem of the country.

2012	National Policy for ICT	<p>National Policy for ICT made special clause on human resource development (Ministry of Human Resource Development India, 2012)</p> <ul style="list-style-type: none"> • With a target of creating a pool of 10 million trained persons in IT sector by 2020, • Establishing centres of excellence in HEIs to produce high quality research and continuous updating of curriculum and syllabi at all levels.
2013	National Skill Qualification Framework (NSQF)	<ul style="list-style-type: none"> • NSQF organizes qualifications according to a series of levels of knowledge, skills and aptitudes (GOI, 2012). • The NSQF levels, which range from 1 to 10, are determined by the learning outcomes that students must have, whether they were acquired through formal, informal, or non-formal education. • NSQF also provides multiple exits between vocational education, skill training, general education and technical education. • NSQF also laid emphasis on lifelong learning and partnership with industry/employer for skill upgradation.
2014	Ministry of Skill Development and Entrepreneurship (MSDE)	<p>MSDE was set up to integrate various skill programmes under one banner and drive the 'Skill India' agenda in a mission mode by enhancing speed and quality of skill programmes (GOI, 2014).</p> <ul style="list-style-type: none"> • Main functional arms of MSDE are: Directorate General of Training (DGT), • National Council for Vocational Education and Training (NCVET), • National Skill Development Corporation (NSDC), • National Skill Development Fund (37) (NSDF), • Sector Skill Councils (SSCs), • National Skill Training Institutes (33) (NSTIs), and various Training Partners. • MSDE also collaborates with the skill training programmes run by other Ministries.
	Apprentices (Amendment) Act 2014	<p>Along with basic amendments in definitions, the Act sets the minimum age for being engaged as apprentice at 14 years and the same for hazardous industries at 18 years.</p>
2015	National Policy on Skill Development and Entrepreneurship Skill India Mission Sector Skill Councils	<ul style="list-style-type: none"> • Superseding NSDP 2009, National Policy on Skill Development and Entrepreneurship focuses on skilling with speed, standard and sustainability. • This policy on one hand laid emphasis on producing quality labour force, on the other it also promotes quality entrepreneurship to create more jobs. • By linking the interests of all stakeholders viz. Government, corporate sectors, trainers and trainees etc. policy also highlights an inclusive approach the development of India by improving employability and productivity. • To achieve its objectives the Policy provides a framework of 11 paradigms namely Aspiration and Advocacy, Capacity, Quality, Synergy, Mobilisation and Engagement, promotion of skilling among women, Global partnerships, Outreach, ICT Enablement, Trainers and Accessors and Inclusivity.
	Launch of PMKVY	<ul style="list-style-type: none"> • Launched in 2015 named PMKVY (1, 2, 3 & 4) • Two Components – Central Component and State Component • PMKVY 1.0 and PMKVY 4.0 have been implement under the Central Component, while the other two phases i.e., PMKVY 2.0 and

		PMKVY 3.0 were implemented under both the Components.(MSDE, 2024)
2016	National Skill Qualification Framework (NSQF)	Alignment of all Skill Development Activities with National Policy and NSQF
2020	New Education Policy (NEP) 2020: Integrated Effort of Education and skill development	NEP 2020 (Pathak, 2020) focuses on revamping the delivery of education and repositioning skill education in India. Policy targets to expose 50% of the learners to vocational education by 2025. Few focus areas: <ul style="list-style-type: none"> • Institutional capacity building. • Collaborations among schools and ITIs. • Neutralising the separation in formal and vocational education, universal and accessibility. • Overcoming social status hierarchy associated with vocational education • social inclusion, gender equality and inclusive education. • Introducing LokVidya (indigenous knowledge and skills) • professional training to improve the quality of vocational teachers • Accreditation of vocational courses

Source: Author's compilation from various Policy Documents

The analysis of India's skill development initiatives from pre-2008 to post-2008 highlights significant progress alongside ongoing challenges. The evolution began with a focus on basic education and has transitioned to a more structured approach through the establishment of institutions like the National Skill Development Council (NSDC) and the Ministry of Skill Development and Entrepreneurship (MSDE). Key policies, such as the National Skill Development Policy and the National Education Policy 2020, reflect a growing emphasis on integrating education and vocational training to enhance employability. Recent initiatives also prioritize inclusivity, targeting marginalized groups and promoting gender equality. While ambitious goals aim to expose 50% of learners to vocational education by 2025, continued efforts are necessary to address existing gaps and ensure quality training, ultimately maximizing India's potential as a skilled labour force globally.

• **Literacy Levels and Skill Education Profile in India**

The effectiveness of vocational education depends on the basic literacy, which is a significant challenge in India. Following table gives a glimpse of literacy rates and vocational training in India.

Table 2: Literacy Level in India*

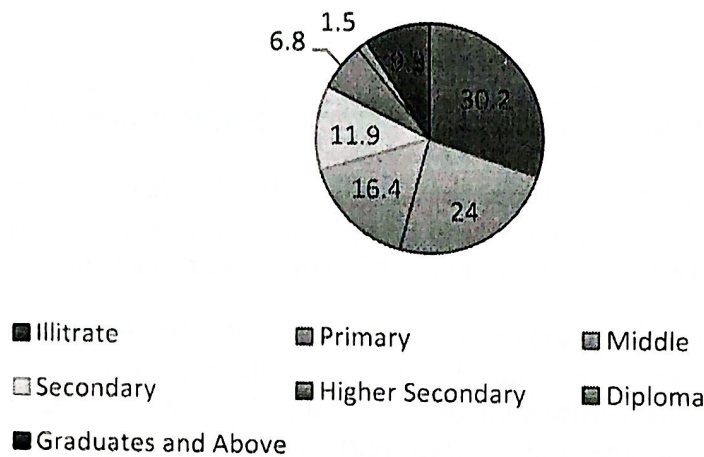
Description	Rural	Urban
No Literacy**	18.2%	5.9%
Literacy Rate	73.5%	87.7%
Male Literacy	81.5%	92.2%
Female Literacy	65%	82.8%
Technical Literacy	1.2%	4.8%
Male Technical Literacy	1.6%	6.3%
Female Technical Literacy	0.5% (0.7%)	3.1%
Formal Vocational Training	overall 4.1%	
Non-formal Training in Vocation	overall 8%	
No formal vocational training	96%	

Source: Compiled from NSS Report No.585 (75th Round): Household Social Consumption on Education in India

According to the NSS Report No.585 on Household social consumption on Education in India, literacy rates reveal stark contrasts between rural and urban populations: while the overall literacy rate stands at 73.5% in rural areas and 87.7% in urban regions, male literacy is notably higher than female literacy (81.5% vs. 65% in rural areas). Furthermore, technical literacy is alarmingly low, with only 1.2% of the rural population possessing technical skills compared to 4.8% in urban areas. Formal vocational training is also limited, with only 4.1% of the population receiving formal training and 3% undergoing non-formal training. 96% of the labour force in India does not receive any training.

Table 3: Education Profile of Labour Force in India(MCRHDRI, n.d.)

Education Profile of Labour force in India



Source: Job, Skill and Education, Marri Channa Reddy Human Resource Development Institute of Telangana

The education profile of India's labour force underscores the pressing need for comprehensive skill development initiatives. 30.2% of individuals within the formal education system are illiterate, highlighting the urgent need for educational reform. Additionally, only 17.6% of the labour force has attained higher secondary education or above, indicating a critical gap in advanced educational attainment.

• Performance of Skill Development Programmes

Following table provides the performance of various skill programmes in India. Most of the skill developments programmes in India present major gaps between enrolment, number trained and certified and placed. Pradhan Mantri Kaushal Vikas Yozana (PMKVY) has an enrolment of 14.2 million individuals out of which 13.7 million individuals received training and around 12 million individuals were assessed and only 11 million certified. Out of certified individuals about 2 million individuals were placed in various jobs making only 22.2% placement rate, this indicates a disconnect between Training and placements.

Table 4: Performance of Few Skill Development Programmes in India

Name of the Scheme	Number Enrolled	Number trained	Number Assessed	Number certified	Number Placed
Pradhan Mantri Kaushal Vikas Yozana (PMKVY)	1,42,65,716	1,37,24,226	1,24,54,858	1,10,40,991	2,18,4565
Jan Shikshan Sansthan (JSS)	26,67,372	26,38,028	26,06,176	25,93,642	NA
Craftsmen Training Scheme (CTS)	65,10,956	62,55,071	NA	41,61,894	NA
National Apprenticeship Promotion Scheme (NAPS)	43,29,424	22,00,543	NA	6,47,420	NA
SANKALP	3,53,106	3,38,254	2,92,933	2,81,610	NA

Source: Dashboards PMKVY, JSS, CTS, NAPS, SANKALP

As clear from the data in the above table other schemes Jan Shikshan Sansthan (JSS), Craftsmen Training Scheme (CTS), National Apprenticeship Promotion Scheme and SANKALP also present the same story of staring gaps between the enrolment, certification and placement.

These figures highlight the pressing issue of low participation and poor employability for individuals who have enrolled in these programmes in comparison to enrolment in formal degree programmes. The gap between enrolments and final certification also highlights the issue of huge dropout ratio. Another issue of the length of the programme ranging from short term to medium term also raises the concern about the quality and applicability of skills acquired as cleared from the difference between number certified and number placed.

• Challenges In India's Skill Journey: Demand Side Vs. Supply Side

India's skill development trajectory faces demand and supply side issues. On the demand side, lack of awareness regarding vocational training options, and the associated stigma of inferiority of vocational courses leads to poor enrolment rates. On the supply side, there is the surplus of unskilled labour and shortage of skilled labour. The poor employability of vocationally trained individuals (as compared to the formally educated) further exaggerates the undervaluation of vocational training.

Table 5: Employability Trends in various courses

Domains	Employability Trends (%)								
	2016	2017	2018	2019	2020	2021	2022	2023	2024
B. TECH/BE	52.58	50.69	51.52	57.09	49	46.82	51.15	64.67	71.5
MBA	44.56	42.28	39.4	36.44	54	46.59	55.09	71.16	78
B.SC.	35.24	31.76	33.62	47.37	34	30.34	38.06	51.27	58
B.COM	20.58	37.98	33.93	30.06	47	40.3	42.62	48.12	55
B.A	27.11	35.66	37.39	29.3	48	42.72	44.2	47.11	54
ITI	40.9	42.22	29.46	NA	NA	NA	31.3	40	41
POLYTECHNIC	15.89	25.77	32.67	18.05	32	25.02	21.42	22.37	29

Source: Author's Compilation from India Skill Report 2016-2025

The table above illustrates the employability trends across the educational domains. While the employability of B.Tech graduates ranged between 50%-71.5% between 2016 to 2024, it averaged at 41% for ITI graduates and 29% for Polytechnic course graduates.

This disparity highlights the preference for formal education, which often yields higher wages and better job prospects, as evidenced by the NSSO report indicating that only 24% of rural students and 8.3% of urban students are enrolled in vocational training institutes.

The report also notes that only 4.1% of India's workforce is formally trained, and only a third of those trained are equipped with employable skills. The low rates of vocational training is also explained by social attitudes that prioritize degree programs, such as engineering or medicine.

This perception has hindered skill-building efforts at the school level, where foundational skilling is most impactful. Admittedly there has been realization that school-level skilling can lead to satisfying, lucrative careers. CBSE now offers some 50 vocational courses and the school management is now encouraging students to discover original or innovative talents in themselves.

• Policy Recommendation and Conclusion

The findings from the analysis of education and vocational training/skilling programmes in India show that an integration suggested by NEP 2020 is the need of the hour. The following recommendations aim to enhance the effectiveness and implementation of these efforts:

- 1) Technical skills, domain knowledge and soft skills should be integrated through targeted training and practical application to enhance gainful employment.
- 2) Training of trainers, especially on aspects of soft-skills training is essential. Inputs from industry can further strengthen this delivery.
- 3) A demand-led approach to skill development is required to ensure the employability of the trained graduates.
- 4) Industry partnerships for placements to enhance employment after certification should be the focus.
- 5) Constant updation of training curricula to keep up with emerging trends across the industry, e.g. AI, ML, etc. is essential. Further, broad-based training needs to be replaced with targeted and specialised training.
- 6) Investments in skilling infrastructure are also required to scale up the vocational training interventions.
- 7) Partnerships for exposure visits, apprenticeship, etc. need to be developed.
- 8) Monitoring of the skill-focused schemes requires effective and pro-active improvements to ensure the programmes are meeting actual industry requirements.

This paper explores the evolution, progress and challenges of skill education in India. Though lot of progress has been recorded both quantitatively and qualitatively, keeping in sight the demographic dividend it is essential to speed up the action, address the challenges with sensitivity to ensure that individuals are fully equipped to meet the demands of the job market. By fostering this comprehensive skill set, we can enhance employability and empower the workforce to thrive in diverse professional environments. India does not have any time to lose in this regard.

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