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Sustainable Development Goals and Vocational Skill Policy: India vis-à-vis Global Scenario

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Abstract

India has historically lagged in providing Technical Vocational Education and Training (TVET) within school education. Enhancing opportunities for imparting relevant vocational skills to school-going adolescents is crucial. Currently, India is on the brink of a demographic dividend, yet fully harnessing this potential remains a significant challenge. According to a World Bank report (2006), only about 5 per cent of India's workforce aged 20-24 are formally skilled, compared to 60-90 per cent in developed countries. By global standards, India is falling short of the Sustainable Development Goals (SDGs). Global experiences indicate that countries with a highly skilled labour force prioritise integrating vocational skill education and vocational career guidance into the regular school curriculum. The work-related based training or vocational education within general educational structure not only reduces dropout rates among vulnerable students but also enhances future career pathways and employment opportunities, fostering inclusive growth and sustainable livelihoods. In India, dropout rates are high at secondary-level, a crucial stage for preparing for higher education or/ and the world of work. Aligning school education with effective vocational skill development programme is vital for addressing dropout challenges among disadvantaged students. It equips the adolescent youth with workforce-ready skills, enhances employability, fosters inclusive growth, and promotes sustainable livelihoods. This approach also plays a pivotal role in supporting the nation's socio-economic development. By 2030, India must expand access to quality education, foster lifelong learning, equip young students with vocational skills and align with global standards to achieve the SDGs. By effectively leveraging India's extensive education system, India can significantly expand the reach of TVET programme, align with global standards, and make significant progress toward achieving SDG goals. This also ensures that India fully prepares to reap its demographic dividend while driving inclusive and sustainable growth.

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The Brundtland Report, published by the World Commission on Environment and Development, defines sustainable development as a framework that meets the needs of the present without jeopardising the ability of future generations to meet their own needs. The report highlights sustainable development as the intersection of three core objectives — environmental protection, economic growth, and social equity (United Nations, 1987). This concept laid the foundation for the Sustainable Development Goals (SDGs), framing sustainable development as a key global policy. Among the SDGs, Goal 4 focusses on ensuring technical and vocational education and training (TVET) or vocational education and training (VET) or vocational education, with an emphasis on equipping adolescent students with the knowledge and practical skills needed for employment in the job market and social inclusion.

UNESCO defines Technical and Vocational Education and Training (TVET) as encompassing education, training, and skills development across a broad spectrum of occupational fields, including production, services, and livelihoods TVET refers to the aspects of education that go beyond general academic instruction to include the study of technologies, related sciences, and the acquisition of practical skills, attitudes, and knowledge relevant to various occupations in economic and social sectors (UNESCO, 2016) This makes TVET a critical bridge between education and the world of work, and an integral part of lifelong learning. In the context of school education, TVET represents a diversified curriculum that combines both vocational and academic content. This curriculum covers a wide range of skill areas such as ICT, electronics, electrical work, craftsmanship, technical labour, agriculture, banking and insurance, food processing, healthcare, beauty and wellness, paramedical services, media and entertainment, tourism, green jobs, and other emerging sectors driven by the service economy. The goal of vocational education (TVET) is to facilitate quick entry into the labour market as a skilled workforce, supporting sustainable livelihoods and promoting economic self-reliance. Most countries, particularly industrialised ones, recognise the importance of technical and vocational education and training (TVET) and its integration with academic curricula. Many of these countries adopt a dual system of education, allowing students at an early age to choose and pursue specific courses and career paths in various fields (Dyanako, 1996).

India is among 196 countries that adopted SDGs at the UN General Assembly. There are altogether 17 SDGs addressing economic, social, and environmental dimensions. These SDGs are indivisible in nature and interrelated. By 2030, member countries are expected to achieve greater access to quality education, promote lifelong learning opportunities, and foster equity, all of which are crucial to sustainable development and reducing global inequalities.

India, having played an important role in shaping the SDG agenda, is expected to play an active role in their effective implementation. The UN identified an indicative set of 232 distinct global indicators for monitoring the SDGs. In this direction, the Government of India, under the Ministry of Statistics and Programme Implementation, developed a National Indicator Framework (NIF) comprising about 300 national indicators of the performance and progress on the SDGs both at the national and state levels.

The 2030 Agenda, among others, underlined the need for inclusive quality education, which is comprehensively addressed under Goal No. 4 of SDGs. The agenda asserts that providing quality education for all is fundamental to creating a peaceful and prosperous world. It is education that ensures people get the knowledge and desired skills needed to get employment, stay healthy, and foster tolerance for all. Crucial to the provisioning of TVET, the agenda of SDG goal 4 has the following salient features achievable by 2030:

- Target 4.3: Ensure equal access to affordable and quality technical, vocational, and tertiary education, including university education for all women and men.
- Target 4.4: Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
- Target 4.5: End gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples, and children in vulnerable situations.
- Target 4.7: Ensure that all learners acquire the knowledge and skills needed to promote sustainable development through education for sustainable development and lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development.

India's new National Education Policy (NEP) 2020 reaffirms its commitment to quality, inclusive education, and technical and vocational education and training (TVET). Unlike previous policies, NEP 2020 emphasises integrating vocational education at all levels, aiming to transform the skills landscape and align with Sustainable Development Goals (SDG) 2030. A key goal is to have 50 per cent of secondary students' exposure to vocational education by 2025, reducing divisions between academic and vocational streams. The policy encourages state schools to adopt a hub-and-spoke model, integrating skill labs to enhance youth employability. The chapter "Re-imagining Vocational Education" underscores its critical role in sustainable livelihoods (Government of India, 2020). The policy recognises that one vital role of formal education is to impart gainful skills to enable students earn decent income for sustainable livelihood when they enter adulthood. Along with this chapter, several parts of the policy also refer to vocational education. NEP 2020, in line with the SDG 2030 agenda, has committed to significantly expand TVET to promote livelihoods and social justice for all through quality lifelong learning opportunities.

The NEP 2020 pays considerable attention to vocational programme integration in all educational institutions such as schools, colleges, and universities to bring a sea change in skill landscape and help leverage its multiple benefits to individuals and society. The salient provisions of NEP 2020 on TVET provisioning are delineated below:

- 50 per cent of secondary students to have exposure to vocational education and to be achieved by 2025. Hence NEP 2020, surpassing targets of previous policies, promotes a broad-based liberal education at school and higher levels, integrating vocational subjects to minimise rigid separations between academic and vocational streams, thus fostering equal learning opportunities
- The NEP promotes a broad based liberal education at school level and continues to higher education, while allowing students access to vocational subjects; thereby reducing hierarchies among different areas of learning opportunities at all levels.
- The NEP emphasises the incorporation of physical education, arts, crafts, and vocational skills throughout the school curriculum. For students in Grades 6-8, the policy introduces engaging vocational courses designed to provide hands-on experience in crafts relevant to local community needs and demands. This approach

aims to strengthen students' connection to their communities and equip them to address local challenges.

- The NEP supports secondary students of Grades 9-12 to take up at least one vocational course covering NSQF levels (1-4).
- The NEP also recommended that all students participate in a 10-days bagless period during which the students intern with local vocational expert.
- To support the effective implementation of vocational education, the NEP proposes hiring local experts as master instructors through short-term training programme.
- The policy promotes integration of vocational education into secondary schools in phases, with collaborations involving ITIs, polytechnics, and local industries. Higher education institutions are also expected to offer vocational courses independently or in partnership with industries and NGOs.
- Under the NEP 2020 framework, higher education institutions are encouraged to offer vocational education either independently or in collaboration with industries, NGOs, and other relevant stakeholders. This initiative aims to dispel the misconception that vocational education is inferior to traditional academic education or is only suited for students with lower academic performance. By integrating vocational training into higher education, the policy seeks to promote its value as an essential component of skill development and career readiness, thereby fostering a more inclusive and equitable education system.
- Additionally, short-term certificate courses, including training in soft skills, will be conducted to enhance employability. These measures collectively aim to bridge the gap between academic education and practical skills, preparing students for diverse career pathways.

The NEP 2020, with its ambitious goal of providing quality vocational education to 50 per cent of India's secondary learners, emphasises the integration of vocational programme in state schools. To achieve this, the policy directs the establishment of skill labs using a hub-and-spoke model, aimed at enhancing skill development and creating employment opportunities for adolescent skilling and employment opportunity of adolescent youth.

Global Scenario & India

Industrialised countries such as Germany, Australia, Switzerland, Finland, Austria, Denmark, Norway, Japan, South Korea, Singapore, Japan, China and so on supported vocational education at the school level on a large scale since the 1970s. These countries have different types of vocational education systems at the school level, for example, Germany has dual system of vocational education that encompasses school education with apprenticeship training (Hoffman and Schwartz, 2015), Singapore's success story of 'experiential learning programme' (Tucker, 2012), China's model 'factories in schools' or 'schools in factories' (Ministry of Education, People's Republic of China, 2019) etc. What's more, in these countries with high skilled labour force, there is substantial convergence of vocational skill education component with regular curriculum in schools and serve multiple purposes — prevention of student dropout tendencies, student exposure to holistic career guidance programme, career

goal setting, readiness for school-to-work transition and so on. Studies by Rumberger (1987); Spence (1986); Pittman (1991); Dynarski, *et al* (2008) found that successful prevention of student dropout resulted from a mix of academic and vocational programmes and inspire learners to experiential learning method.

This is a significant observation especially for students of higher grades whose dropout tendency increases. For example, India registers high student dropout rate, particularly at secondary stages. The data from the Unified District Information System (UDISE), NIEPA, Ministry of Education, Government of India reveal that the gross enrolment rates at the primary level during 2018-19 and 2020-21 were 101.3 per cent and 103.3 per cent respectively. During the same period, the corresponding figures for upper primary level were 87.4 per cent and 92.3 per cent while these figures were 76.9 per cent and 79.8 per cent for secondary grade and 50.14 per cent and 53.8 per cent for higher secondary grade. The data trend depicts low transition as students enter higher grades, and disproportionate dropout rates at the secondary and higher secondary stages.

Adolescent students dropping out of school often occurs after they have successfully gained access, but leaving school mid-way limits their future employment opportunities. Without further education or skill training, most dropouts face challenges securing steady work and a decent income. This challenge is heightened by the evolving economy, where technology and changing job structures demand adaptable skills. In India, secondary education shows a particularly high dropout rate, a critical stage for preparing students for higher education or employment. Connecting these at-risk students to career-oriented programme, vocational courses, and school-to-work opportunities could help them stay in school longer and improve sustainable livelihood opportunities. Research supports the potential of vocational education at the school level to improve student outcomes. For instance, Pavlova and Maclean (2013) highlight that vocationalisation enhances social inclusion for disadvantaged groups by reducing educational gaps. Vocational education is also seen as an effective means to integrate economically marginalised groups into the mainstream, as noted by Weisberg (1983). Lills and Hogan (1983) maintain that vocational education aims to alleviate unemployment by transmitting skills and attitudes useful in employment. According to Tilak (2007), vocational education promotes equity with a rural slant and serves the need of the relatively poor. Vocationalisation of school education promotes unity of theoretical knowledge with practical skills, promotes rural socio-economic prosperity, and reduces the spectre of youth unemployment. Lauglo (2005) suggests that countries with democratic policies often include vocational training in schools to promote social inclusion and reduce class divide.

Status of Provisioning of TVET at School Level: International Perspectives

Countries with successful vocational education programme utilise a dual system that integrates school-based and work-based learning through strong industry partnerships. In these nations, policies promote collaboration between industries, skill providers, and schools, ensuring vocational training is both practical and effective. In most of these countries, the government doles out favourable schemes and policies for school going adolescent youth. For instance, over 90 per cent of students in China's secondary vocational schools receive

tuition exemptions, which increases enrolment and builds a skilled labour force (Yuan & Wang, 2021). China's success stems from integrated industry-school partnerships, collaboration with international vocational providers, and a disciplined, skilled teaching workforce. Similarly, Mexico's vocational system draws heavily from Germany's dual approach, combining employer-based training with school education (Vogelsang *et al*, 2022). A key feature across these models is industry involvement, from training provision and costs to placement and employment opportunities. Additionally, direct pathways from vocational programme to higher education support student career progression. Japan exemplifies this with 98 per cent of upper secondary students in vocational tracks having direct access to tertiary education (OECD, 2020), setting a high standard for vocational programme effectiveness.

In South Asia, including India, vocational education receives lower priority compared to the emphasis on preparing students for higher general education. This creates a clear divide between vocational and general education streams. Many South Asian countries face challenges in implementing effective vocational policies, struggling to turn plans into practical outcomes. Table 1 shows the enrolment percentages in vocational education at the secondary level across developed and South Asian countries from 2016 to 2020, highlighting the significant gaps. Developed countries consistently outperform South Asian countries in vocational enrolment. For instance, Finland had 47.8 per cent of secondary students in vocational programme in 2016, slightly declining to 43.1 per cent by 2020. In South Asia, the Maldives leads in vocational enrolment, while Nepal had the lowest percentage throughout 2017–2020. Data also shows slight increase in vocational enrolment in Bangladesh, Bhutan, Pakistan and Nepal from 2016 to 2020, with India's rate growing by only 1.8 per cent during this period.

Figure1 depicts countries classified by level of student enrolment in vocational education. As is evident from Figure 1, South Asian countries have very low level of enrolment in vocational education at the secondary level. In contrast, Australia, Austria, China, Finland, Germany, Mexico, and Switzerland have high enrolment rate at more than 10 per cent. Additionally, it is noteworthy that countries with higher vocational enrolment rates also tend to promote and exhibit increased completion rates at the lower secondary education level. For example, in 2019, the secondary completion rates were 97.7 per cent in Austria, 95.6 per cent in Switzerland, and 90.7 per cent in Mexico.

TABLE 1

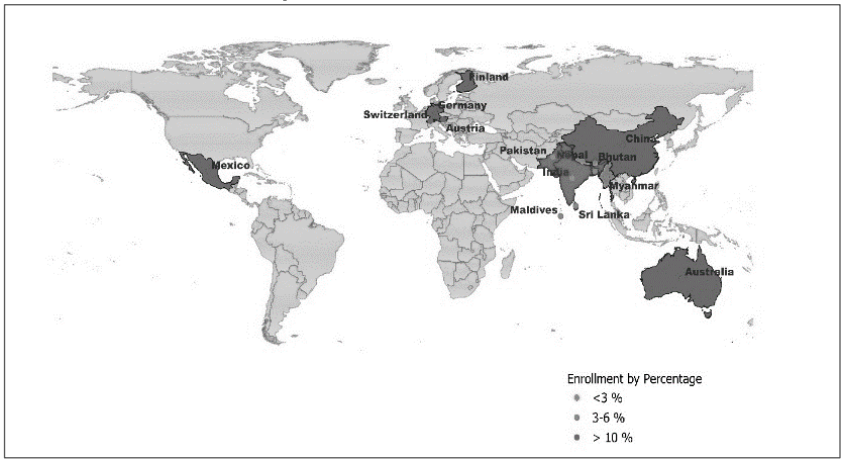
Share of All Students in Secondary Education Enrolled in Vocational Programme (2016-2020)

Country	*2016*	*2017*	*2018*	*2019*	*2020*
Australia	37.3	36.6	28.9	32.6	29.1
Austria	35.1	34.6	34.4	34.8	34.8
Bangladesh	3.9	4.0	4.7	4.0	5.0
Bhutan	1.9	2.0	2.0	..	..
China	19.7	19.1	18.8	18.0	17.8
Finland	47.8	48.1	47.8	44.0	43.1
Germany	19.1	19.1	19.1	19.4	19.4
India	1.3	1.7	1.3	1.3	3.1
Maldives	..	..	10.9	6.3	..
Mexico	27.5	26.7	27.6	28.0	26.7
Nepal	..	0.3	..	1.2	1.9
Pakistan	2.5	2.8	3.3	3.1	..
Sri Lanka	4.2	3.7	3.8	..	..
Switzerland	37.4	37.1	36.8	36.4	36.0

Source: http://data.uis.unesco.org

FIGURE 1

Countries Classified by Level of Enrolments in Vocational Education



Source: Based on Table 1

Status of Provisioning TVET at the School Level in India

India has a vocational and training education system that represents the single most significant area in which educational policy must attempt to make a breakthrough. In this direction, the policy trends and developments clearly reveal renewed commitment to integrate vocational programme in school education. Since the early 1990s, secondary schools (Grades XI and XII) in India have been engaged in the provision of vocational education. Of late, to scale up with speed in skilling youth in India, concerned departments and ministries of the Government of India have taken up programmes such as Pradhan Mantri Kaushal Vikas Yojana; SWADES; Seekho aur Kamao; Jan Shikshan Sansthan; Sankalp; Udaan; School Initiatives and Higher education; Craftsman Training Scheme; Vocational Training programme for Women; vocationalisation of school education, and so on. Some of these programmes and schemes are at the school level and some schemes/programmes are running as informal training schemes. For example, the aim of Jan Shikshan Sansthan scheme is to raise the efficiency, productive ability, and livelihood opportunity of the non/neo literates, school dropout learners and persons having rudimentary level of education up to Grade 8 through improving their occupational skills and technical knowledge.

These efforts have made notable progress in the skilling of workforce. As per the NSDC report (2022), there are 538 NSDC training partners and 10373 training centres offering 1500+ job roles. These training partners and centres are managed by 38 sector skill councils. As informed by the report, these centres trained 20.45 lakhs students, of which 1.86 lakhs students got placement or employed. These are noticeable efforts on the part of the government to build robust skill ecosystem.

These developments could be seen as a response to various socio political, and economic transformations. For example, after economic liberalisation, India's need for skilled workforce began to grow during the mid-1990s and the need for up-skilling its youth population in a variety of sectors including the service sector. During early 2000s, India set ambitious targets to mainly address demographic dividend by skilling 500 million youth by 2022; and address several other challenges including India's unprecedented growth of higher education and the spectre of youth unemployment.

Vocationalisation of school education is a leading initiative aimed at equipping adolescent students with essential and practical skills. This initiative is a part of the comprehensive education scheme, Samagra Shiksha Abhiyan. The aim of the scheme is to prepare educated, employable, and competitive human resources for various sectors of the economy, and global market by integrating vocational education with general academic education, especially at the school level. The vocational education component is available to students from Grade VI to XII. For students in Grades VI to VIII, the scheme provides exposure and orientation to vocational education, aiding them in making informed subject choices when they are transitioned in higher grades. At the secondary level (Grades IX and X), students can study vocational modules as an additional subject. In senior secondary levels (Grades XI and XII), vocational subjects become compulsory electives, ensuring students gain valuable vocational skills alongside their academic education. Table 2 and Table 3 outline optional skill subjects at the secondary level and elective skill subjects at senior secondary levels.

TABLE 2

Skill Subjects Offered at Secondary Levels

Sl. No.	*SUB CODE*	*COURSE NAME*	*JOB ROLES*
1	401	Retail	Store Operations Assistant
2	402	Information Technology	Domestic IT Executive/ Operator
3	403	Security	Unarmed Security Guard
4	404	Automotive	Automotive Service Technician
5	405	Introduction To Financial Markets	Business Correspondent
6	406	Introduction To Tourism	Assistant Tour Guide
7	407	Beauty & Wellness	Assistant Beauty Therapist
8	408	Agriculture	Solanaceous Crop Cultivator
9	409	Food Production	Assistant Chef (reg.)
10	410	Front Office Operations	Front Office Executive
11	411	Banking & Insurance	Field Executive
12	412	Marketing & Sales	Marketing Assistant
13	413	Health Care	General Duty Assistant
14	414	Apparel	Hand Embroider
15	415	Multi Media	Texture Artist
16	416	Multi Skill Foundation course	Multi Skill Assistant
17	417	Artificial Intelligence	
18	418	Physical Activity Trainer	Early Years Physical Activity Facilitator
19	419	Data Science	
20	420	Electronics & Hardware (NEW)	Field Technician – Other Home Appliances
21	421	Foundation Skills for Sciences (Pharmaceutical & Biotechnology) (NEW)	
22	422	Design Thinking & Innovation (NEW)	

Source: https://cbseacademic.nic.in/skill-education.html

TABLE 3

Skill Subjects Offered at Senior Secondary Levels

S. No.	*SUB. CODE*	*NAME*	*JOB ROLES*
1	801	Retail	Sales Associate
2	802	Information Technology	IT Helpdesk Assistant
3	803	Web Application	Web Developer
4	804	Automotive	Automotive Service Technician
5	805	Financial Markets Management	Equity Dealer/ Mutual Fund Agent
6	806	Tourism	Tour Guide
7	807	Beauty & Wellness	Beauty Therapist
8	808	Agriculture	Agriculture Extension Worker
9	809	Food Production	Trainee
10	810	Front Office Operations	Counter Sales Executive
11	811	Banking	Sales Executive (Banking product)
12	812	Marketing	Marketing Executive
13	813	Health Care	General Duty Assistant
14	814	Insurance	Sales Executive (Insurance)
15	816	Horticulture	Floriculturist / Entrepreneur
16	817	Typography & Comp. Application	Executive Assistant
17	818	Geospatial Technology	GIS Operator
18	819	Electrical Technology	Field Technician /Home Appliances
19	820	Electronic Technology	Installation Technician
20	821	Multi-Media	Animator
21	822	Taxation	Asst. Tax Consultant/GST Acc. Asst.
22	823	Cost Accounting	Jr. Accountant
23	824	Office Procedures & Practices	Executive Assistant
24	825	Shorthand (English)	Stenographer
25	826	Shorthand (Hindi)	Stenographer
26	827	Air-conditioning & Refrigeration	Service Technician
27	828	Medical Diagnostics	Medical Lab Technician
28	829	Textile Design	Design Assistant (Apparel/Textile)
29	830	Design	Assistant Designer
30	831	Salesmanship	Sales Executive
31	833	Business Administration	Business Executive

Cont…

32	834	Food Nutrition & Dietetics	Assistant Dietician
33	835	Mass Media Studies	Media Assistant
34	836	Library & Information Science	Library Assistant
35	837	Fashion Studies	Assistant Fashion Designer
36	841	Yoga	Yoga Instructor
37	842	Early Childhood Care & Education	Early Childhood Educator
38	843	Artificial Intelligence	
39	844	Data Science	
40	845	Physical Activity Trainer (NEW)	Primary Years Physical Activity Facilitator
41	846	Land Transportation Associate (NEW)	Land Transportation Associate
42	847	Electronics & Hardware (NEW)	Installation Technician – Computing and Peripherals
43	848	Design Thinking & Innovation (NEW)	

Source: https://cbseacademic.nic.in/skill-education.html

TABLE 4

Status of States with Vocational Education Implemented in School

India/ State/ UT	*Number of secondary and higher secondary schools*	*Number of secondary and sigher secondary schools having vocational courses under NSQF at secondary/higher secondary level*	*Total enrolment under NSQF at secondary/higher secondary level*	*Gross enrolment rate at secondary level*	*Gross enrolment rate at higher secondary level*
India	291466	12292 (4.21%)	1013996 (1.53%)	79.8	53.8
Andaman and Nicobar Islands	121	49 (40.49%)	5781 (26.70%)	78.2	49.9
Andhra Pradesh	15183	476 (3.13%)	40137 (1.78%)	84.2	53.4
Arunachal Pradesh	476	99 (20.79%)	11067 (15.18%)	68.2	41.1
Assam	9823	339 (3.45%)	20249 (1.38%)	75.6	32.3
Bihar	12334	0(0%)	0	63.5	34
Chandigarh	169	28 (16.56%)	4157 (5%)	86.2	57.6
Chhattisgarh	7275	546 (7.50%)	67893 (4.33%)	86.2	57.6
Dadra & Nagar Haveli	99	9 (9.09%)	911 (2.99%)	77.0	45.0
Delhi	2157	347 (16.08%)	72734 (5.48%)	116.3	82.1
Goa	526	121 (23.03%)	5923 (6.65%)	91.1	69.9

Cont…

Gujarat	12709	252 (1.98%)	14386 (0.50%)	78.6	41.8
Haryana	8522	1074 (12.60%)	91587 (5.51%)	95.2	66.8
Himachal Pradesh	4259	953 (22.37%)	42074 (9.60%)	100.4	85.6
Jammu and Kashmir	4405	714 (16.20%)	44782 (7.29%)	59.8	50.1
Jharkhand	4961	440 (8.86%)	25698 (1.50%)	63.0	43.9
Karnataka	21068	203 (0.96%)	9119 (0.29%)	90.6	55.6
Kerala	4921	233 (4.73%)	300 (0.01%)	97.6	84.2
Ladakh	161	28 (17.39%)	1151 (8.49%)	58.7	48.5
Lakshadweep	15	0(0%)	0	77.7	67.6
Madhya Pradesh	17904	1200 (6.70%)	112084 (3.00%)	71.3	45.4
Maharashtra	28505	661 (2.31%)	49395 (0.75%)	92.6	68.2
Manipur	1214	97 (9.99%)	6945 (4.30%)	75.7	61.2
Meghalaya	1827	22 (1.20%)	1413 (0.80%)	84.9	41.1
Mizoram	900	46 (5.11%)	2411 (3.70%)	91.6	54.1
Nagaland	778	26 (3.34%)	1633 (1.83%)	59.7	33.7
Odisha	11969	953 (7.96%)	78336 (3.78%)	84.5	46.4
Puducherry	385	9 (2.33%)	822 (1.07%)	78.9	67.8
Punjab	9653	989 (10.2%)	84826 (4.78%)	109.2	77.8
Rajasthan	31463	905 (2.87%)	98698 (2.16%)	84.8	62.1
Sikkim	266	194 (72.93%)	14581 (36.34%)	90.0	59.5
Tamil Nadu	13891	120 (0.86%)	18695 (0.49%)	92.6	76.5
Telangana	14554	194 (1.33%)	19865 (1.04%)	92.3	61.8
Tripura	1157	135 (11.66%)	4917 (2.81%)	78.9	45.8
Uttar Pradesh	33196	161 (0.481%)	2192 (0.02%)	66.4	48.8
Uttarakhand	3930	0	0	91.5	72.7
West Bengal	10690	669 (6.25%)	59234 (1.22%)	91.2	58.5

Source: UDISE+ (2020-21)

As is indicated by Table 4, out of all secondary and higher secondary schools in India, only 4.21 per cent (12,292 schools) offer vocational courses under the National Skills Qualification Framework (NSQF). Bihar, Uttarakhand, and Lakshadweep have no schools providing such courses, while Sikkim leads with 72.93 per cent of its schools offering NSQF programme. Sixteen states, including Maharashtra, Karnataka, Rajasthan, and Uttar Pradesh, and the union territory of Lakshadweep fall below the national average of 4.21 per cent enrolment in NSQF courses is also alarmingly low, with a national average of just 1.53 per cent. Thirteen states record enrolment below this figure, while Bihar, Uttarakhand, and Lakshadweep have no participation. In contrast, Sikkim achieves a remarkable enrolment rate of 36.34 per cent, significantly surpassing the national average.

Present Study: Aims and Research Questions

This study explores how vocational skill policies can reduce dropouts, enhance employability, and promote sustainable livelihoods for adolescents. The study examined school resources — physical, human, and facilities like labs, career guidance facilities, and specific vocational skills students aim to acquire before completing senior secondary education.

Based on the findings from the broader study, the main research questions guiding the present study are:

- How effective is the provisioning of vocational education (TVET) programmes under the Samagra Shiksha Abhiyan in secondary education?
- What are the aspirations of students regarding vocational skill education before completing secondary education?
- How do teachers perceive the relationship between vocational skill interventions, dropout reduction & employability among secondary students?

Tools and Data Collection

The study was conducted in Koraput and Rayagada districts of Odisha and Goalpara and Barpeta districts of Assam. Predominantly employing a variant of the quantitative survey method, the study also conducted in-depth interviews with 270 teachers and 900 students from 90 government schools in Odisha, and 160 teachers and 800 students from 80 government schools in Assam. The sample focused on adolescent students aged 14–19 in secondary (grades IX–X) and higher secondary (grades XI–XII) levels. Participants included head teachers, class teachers, and students, as indicated in Table 5.

The study explored student vocational aspirations through focus group discussions and in-depth teacher interactions. Teachers' perceptions were analysed regarding vocational guidance availability, its impact on dropout reduction, and student employability. Data collection included absence of vocational programme and policy implementation inputs/challenges from head teachers, vocational interventions, dropout information, and employability perspectives from class teachers, alongside student vocational aspirations. Data was digitised for standardised analysis, with quantitative data coded systematically. All information was analysed using statistical tools to ensure accurate interpretation and comprehensive findings.

TABLE 5

Sample Description of Participants

Districts	*Number of schools*	*Number of head teachers*	*Number of class teachers*	*Number of students*
Koraput	50	50	100	500
Rayagada	40	40	80	400
Goalpara	40	40	40	400
Barpeta	40	40	40	400
Total	**170**	**170**	**260**	**1700**

Source: Primary Survey

TABLE 6

Schools Providing Vocational Courses & Students Aspiring for Vocational Courses before Completion of Grade XII

Districts	*Number of schools*	*Schools providing vocational courses (%)*	*Students aspiring for vocational skills before completion of Grade XII (%)*	*Students who didn't have fulltime exposure to vocational programme (1%)*
Koraput	50	8%	94%	79.2%
Rayagada	40	35%	58%	63.5%
Goalpara	40	20%	82%	80%
Barpeta	40	29%	90.75%	90%

Source: Primary Survey

As depicted in Table 6, the present study underscores high level student aspiration for vocational courses before completing secondary school — 94 per cent in Koraput, followed by 90.75 per cent in Barpeta, 82 per cent in Goalpara and 58 per cent in Rayagada. Despite this strong interest, the study found only a small percentage of sample schools offer such courses: 8 per cent in Koraput, 20 per cent in Goalpara, 29 per cent in Barpeta, and 35 per cent in Rayagada. This suggests that a significant majority of secondary students remain deprived of opportunities to develop skills in various vocational trades. Additionally, the study found that vocational courses provided in the sample schools of Assam are limited to trades such as IT Application, stenography, travel & tourism, and textile design. In Odisha, vocational trades taught in sample schools include plumbing, poultry farming, agriculture, and computer application.

TABLE 7

Student Vocational Aspirations in Various Trades

Trades	*Koraput*	*Rayagada*	*Goalpara*	*Barpeta*
Engineer	5(1.25%)	2(0.5%)	27 (6.75)	1 (0.25%)
Computer skills	11 (2.75%)	71(17.75%)	79 (19.75%)	31 (7.5%)
Laboratory Technician			50 (12.5%)	
Apparel		68 (17%)		
Weaving		12 (3%)		
Handicraft		3 (0.75%)		
Automobile		12 (3%)		
Tailoring	8 (2%)	12 (3%)	18 (4.5%)	83 (20.75%)
Textile	3 (0.75%)	0	44 (11%)	82 (20.5%)
Beauty & Wellness	9 (2.25%)	32 (8%)	26 (6.5%)	44 (10%)
Health Care	3 (0.75%)	7 (1.75%)	4 (1%)	3 (0.75%)

Cont…

Agriculture		8(2%)		12 (3%)
Horticulture		3(0.75%)		
ITI/Polytechnique related field	21 (5.25%)	41 (10.25%)	59 (14.75%)	46 (11.5%)
Business			2(0.5)	6 (1.5%)
Dairy Farm			1 (.25) %	3 (0.75%)
Food Production		4(1%)		18 (4.5%)
Fashion designer	1 (0.25%)		4 (1%)	21 (5.25%)
Photography		1 (0.25%)		
Banking				4 (1%)
Front Office Operations	3 (0.75%)	3 (0.75%)	1 (0.25%)	2 (0.5%)
Hotel management			1 (0.25%)	1 (.25%)
Soft Skills			7 (1.75)	
Retail		1 (0.25%)	10 (2.5%)	2 (.5%)
Game designer				1 (.25%)
Poultry				2 (0.5%)
Tourism and travel			8 (2%)	0
Not sure	84%	33.75%	15%	10.75%

Source: Primary Survey

Table 7 highlights the vocational trades and skills that secondary level students aspire to acquire before completing school. The data depicts that students in Assam have identified a wide range of vocational trades and skills compared to students in Odisha. This could reflect differences in awareness, exposure, or local economic/market opportunities influencing student decision for vocational trades aspirations. As is indicated by Table 7, in Assam, students are more aware of various vocational opportunities available locally or regionally, leading to a broader range of identified trades selected by students. In contrast, in Odisha, level of student awareness about emerging skill opportunities in various trades is quite low or shape their vocational aspirations differently. Understanding these aspirations is essential for designing educational programmes that align with students' interests and local economic needs. This alignment can enhance student engagement, making education more relevant and meaningful while improving their prospects for employability and geared towards sustainable livelihoods.

Vocational Skills: High Student Aspirations, Low Institutional Priority

The study reveals a strong student preference for vocational programme across various trades, as highlighted in Tables 6 and 7, indicating the perceived value of vocational education in motivating students to stay in school and acquire skills. Teacher responses noted that integrating vocational education into the curriculum enhances engagement, retention, and socio-economic outcomes. In Odisha, 94 per cent of teachers in Koraput and 85.26 per cent of teachers in Rayagada opined that vocational programmes reduce dropout rates and prepare

students for future career paths. Conversely, in Assam, teachers did not directly link vocational programmes to dropout reduction. However, 80 per cent of teachers in Barpeta and 70 per cent of teachers in Goalpara emphasised the programmes' role in skill development, income generation, and financial security. They also highlighted vocational education's potential to motivate students to complete their education and reduce migration for jobs, thus addressing socio-economic challenges.

Despite the numerous potentials of an effective vocational-school interface, many sample schools were found lacking in TVET implementation. There are several key factors cited by the teaching community. In Koraput district, 100 per cent of teachers identified insufficient funding as the primary barrier, a concern echoed by 50 per cent of teachers in Rayagada district. Funding issues were also prominent in Assam, with 95 per cent of head teachers in Barpeta and 70 per cent of teachers in Goalpara highlighting it as the main obstacle. Additionally, the lack of basic infrastructure to support vocational programmes was noted by 10 per cent of teachers in Rayagada, 80 per cent of teachers in Goalpara and 100 per cent of teachers in Barpeta. Furthermore, a perceived lack of government support was cited by 85 per cent of teachers in Barpeta, 30 per cent in Goalpara, and 35 per cent in Rayagada. These findings suggest that the educational deficiencies and gaps in TVET implementation reflect uneven execution of overarching national education schemes, such as the Samagra Shiksha Abhiyan (SSA).

The Sustainable Development Goal (SDG) 4 emphasises that nations must take necessary steps to provide quality TVET training in a wide range of occupational fields, equipping adolescents with the relevant skills needed for employment and social inclusion. However, as highlighted in this study, while many nations — particularly advanced ones — have made significant strides toward achieving SDG 4 India like several other South Asian countries, faces considerable challenges in meeting various aspects of this goal, especially, in TVET. India's slow progress in SDG attainment, particularly in TVET, is concerning, especially given the low educational participation, accompanied with high dropout rates at the secondary level and the country's vast potential for harnessing its demographic dividend. Furthermore, it can be noted that research by Lall (2022) indicates that the Indian economy is transitioning toward a knowledge-based model, necessitating a new generation of educated and skilled individuals. Additionally, Nobel laureate Amartya Sen (2015) cautioned against the risks of decoupling economic growth from the quality of a healthy and educated workforce.

Suggestive Model of Vocationalisation of School Education in India

Leveraging India's extensive education system is key to expanding the reach and effectiveness of TVET programme. This paper proposes a detailed model that incorporates key elements from some of the successful global educational practices along with best practices from progressive Indian states and skilling policies to accelerate progress toward Sustainable Development Goal (SDG) and align with global standards.

1. Integration of Vocational and Academic Education:
    - Introduce vocational streams in all existing schools to foster flexibility student choice, engagement based on interests, and aptitudes with a focus on innovation and entrepreneurship by incorporating policy initiatives of NITI Aayog — *Atal Innovation Mission, 2016.*
    - Given India's uniquely rich, diverse landscape, geography and bioresources, local skills are bound to be specific and vary among population groups. Reinforce the emphasis on *Lokvidya* of NEP 2020, while seamlessly integrating emerging technologies into TVET to empower students with industry-relevant skills and preparing them effectively for the demands of Industry 4.0 in India
    - Offer a combination of vocational courses and academic subjects to ensure a well-rounded education.
    - Provide flexibility for students to choose their vocational specialisation based on their interests and aptitudes
2. Practical Training and Industry Collaboration:
    - Forge strong partnerships with industries, businesses, and trade associations to develop vocational curriculum that ensures job-market relevance.
    - Incorporate practical training, internships, and apprenticeships to provide hands-on experience and exposure to real-world work environments.
    - Establish vocational training centres equipped with modern facilities, tools, and equipment relevant to the chosen vocational streams.
3. Qualified and Trained Faculty:
    - Develop a robust system for training and certifying vocational teachers to ensure they possess both subject expertise and pedagogical skills.
    - Introduce business, industry, and/or trade sabbatical for vocational teachers to ensure expertise in ever-evolving industry trends and the attendant workforce skills.
    - Provide continuous professional development opportunities for the career advancement of vocational teachers.
    - Facilitate teacher exchange programmes with countries known for their strong vocational education systems.
    - Conduct sensitisation programmes of school key stakeholders such as school management committees and teachers, most of whom are still ill equipped with the know-how of policies of provisioning of vocational education in schools.
4. Career Guidance and Counselling:
    - Integrate comprehensive career guidance and counselling services to help students make informed vocational choices based on their interests, aptitudes, and market demands.
    - Collaborate with vocational experts, career counsellors, and industry professionals to provide personalised guidance and mentorship to students.
    - Organise career fairs, workshops, and vocational exposure programmes to familiarise students with different career paths and industry requirements.

5. Standardised Certification and Recognition:

    - Develop a national certification framework that provides standardised qualifications for vocational skills.
    - Collaborate with industry representatives and professional bodies to design certification standards and ensure their alignment with industry requirements.
    - Establish partnerships with international organisations to ensure the recognition and portability of vocational qualifications beyond national borders.

6. Entrepreneurship and Innovation:

    - Introduce entrepreneurship education as an integral part of vocational programmes, nurturing creativity, problem-solving skills, and business acumen.
    - Encourage students to develop innovative projects and business ideas through mentorship programmes and incubation centres.
    - Foster collaboration between vocational students and startups or small businesses to provide practical exposure to entrepreneurship.

7. Government Support and Funding:

    - Allocate adequate resources, funding, and infrastructure for the development and implementation of vocational education programmes.
    - Create policies that incentivise industries to participate in vocational training initiatives and provide apprenticeship opportunities.
    - Establish regulatory bodies to monitor the quality of vocational education and ensure adherence to standards.

8. Public-Private Partnerships:

    - Foster collaborations between educational institutions, industries, and civil society organisations to leverage expertise and resources.
    - Encourage industries to actively engage in curriculum development, mentorship programmes, and internships to bridge the gap between academia and the job market. Promote corporate social responsibility initiatives that support vocational education, scholarships, and skill development programmes.

Given India's current TVET status within the broader education spectrum — which is far from meeting the SDG goals — India is on the brink of an educational crisis comparable to a tsunami or pandemic. This crisis demands immediate and comprehensive action to address the emergency in Indian education.

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