Elusive Vocational Education Programme: An Analysis of Trends in Indian Secondary Schools

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Vocational education, based on occupation and employment, is also known as career and technical education (CTE) or technical and vocational education and training (TVET). It prepares students, with specific skills, through practical sessions for careers at various levels in all spheres of life. Vocational education (VE) in India has been an age-old dream that is sought to be realised in the context of the changing demographic dividend. As projected, by 2020, the population in the working age group (15–59) years is likely to increase from 58% in 2001 to more than 65% by 2021. "Demographic Dividend" is the term used for the population in the younger age group of 20–35 years, which makes India as the "country with the maximum young population" in the world (Mehrotra 2014). As a response to this, the Government is focussing on vocational education by taking a number of important initiatives in this area. The link between education and employment has always been debated on the basis of acquiring either knowledge or skills. Historically, in India, the basis of colonial education was to prepare the local masses for administrative jobs by providing basic skills alone. The Macaulay's minute had been a landmark as it stated that education was only related to the idea of acquiring a job in the government sector. With this backdrop, vocational education can also be traced from the historical context and this is imperative in understanding the implementation of the vocational education programme.

The trend of increasing industrialisation and declining agriculture, since the nineties, is the consequence of the youth migrating from rural to urban areas in search of profitable employment. The education and skill characteristics are not in line with the rapidly industrialising and developing economies. A broad shift in the occupational structure of the Indian economy–from farm to non-farm—has resulted in new skill requirements for the emerging workforce. The World Bank indicates

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that skill development enrolment in vocational education in India is negligible when judged by international comparisons. It also states that only five per cent of the Indian labour force in the age group of 20–24 has received vocational training (World Bank 2008). As a follow-up, India developed a roadmap for skill development, with an institutional structure at the national level, which was followed by the National Policy on Skills Development in 2009, with the target of imparting skills' training to 500 million by 2022. It also focussed on outcome and linkage to jobs and employability of the trained people (GOI 2009).

Globally Sustainable Development Goals (SDG) 2030 focusses on building capacities and TVET, in particular, presents an account of practices adopted for the economic development of the country. In one of its capacity building programmes for the African region, it was pointed out that there is a need to transform the TVET at the national and institutional level, informed by global and regional trends and vision, through the alignment of local issues with the regional and global agendas (UNESCO 2017). While many Asian countries like Malaysia, Korea, Singapore, etc. have focussed on the TVET since the nineties with emphasis on aligning the multiple departments for providing the implementable policy with the attainable goal. (Tilak 1988 and 2003)

In the Indian context, vocational education and training was introduced way back in 1854. However, the goal for its expansion is far from being realised due to various pertinent issues, one of them being that this education is the last option rather than a choice for the students and this aspect is explored in the paper. This paper takes into account the genesis of vocational education and its growth in the secondary education with a focus on its impact on the education system. It also traces the development of vocational education through the Five Year Plans of the country for analysing the trends. The involvement of various players, who have no interface with each other in designing the curriculum to its delivery to students, is probed through identification of gaps between policy and practice by addressing the demand for creating employment opportunities for educated students. The focus of the paper is on identifying the issues and challenges in vocational education with a way forward in realising the promise of employment for all.

1 Tracing the Origin of Vocational Education

Vocational education is an area that needs to be explored through the lens of employability as the goal which needs to be traced from school education. This needs to be in tune with designing of policies for increasing avenues in the job market for students, as per their demands, though in reality, there is a mismatch between the job market and number of persons equipped with skills. This section traces vocational education from its roots, with an attempt to probe its demand which is seen usually as the last option rather than the choice.

1.1 Pre-independence

Eighteenth century was an era that witnessed the industrial revolution where the human resources got replaced with machines for goods production. This led to the need for trained persons for handling the technology, and this was met through formal training in the technology. In the Indian context, this economic change in the world, that demanded technically trained employees to meet the occupational needs, led to the change in the education system. As a colonial nation, the focus was to acquire trained human resources through technical education for which the vocational education and training was conceptualised to meet the demand of the industries. It must be noted that the technical education centres that focussed on providing training for middle-level technical personnel required improvement in the physical infrastructure or the artisans and craftsmen for maintaining appliances and apparatus of the armed forces.

The demand of skilled manpower was firstly addressed in the Woods Dispatch 1854 that recommended to establish professional or vocational institutions offering specialization in medicine, engineering, law and other professions. Later Hunter Commission (1882) also emphasized to the provision of vocational education but only it was confined to the Bombay Province that too in the area of agriculture. The period from 1902–1921 illustrates that there had been no major progress in the vocational education as no adequate measures were taken to mainstream it as was desired by the Hunter Commission and, further, there was no demand for it. (Nurullah and Naik 1943)

In 1929, Hartog Committee also pointed out that formal education overscored the vocational education as it had 'little contact with the educational system and was, therefore, largely infructuous'. Later, in 1934, Sapru Committee recommended 11 years of school education with vocational studies, commencing after school education. In 1937, Abott and Wood's Report on problems of vocational education recommended that the colonial government start its first massive nation-wide training programme in 1940 under "War Technicians Training Scheme", to meet urgent defence requirements, related to World War II, in the country. The report is crucial as many of the issues are found to still have contemporary relevance in so far as comparison with the subject stream specialisation and its expansion throughout the country is concerned.

During the same time in 1937, the Wardha Scheme also focussed on teaching the basic craft through vocational in the self-sufficient mode, with special focus on manual labour. This was thought to be the best way of individual learning, leading to earning of a livelihood since it was linked with the child's surroundings. Thus, it can be concluded that there was no consensus on the designing and implementation of vocational education at this point of time as the vocations were based on providing support to the government requirements while earning a livelihood. The vocational education was an integral part of the learning in the informal manner as it was an in-built part of the social structure. Employability was the first priority of an educated person due to economic necessity. Similarly, Sargeant Report (1944)

also recommended having adequate provision for efficient training with practical exposure.

While the pre-Independence era formed the backdrop for the genesis of the vocational education since 1854, the expansion took place only after the Abott and Wood's Report in 1937. The reports of various committees pointed out that there was a lack of demand for vocational education as also the nature of courses to be transacted. This led to the sluggish progress of vocational education that was further accentuated due to the lack of funds and trained teachers.

1.2 Post-independence

In continuation of the need for skilled human resources for economic and industrial development post-Independence, the All India Council for Technical Education (AICTE) , established in 1945, took initiatives for expansion of technical institutions throughout the country. The major focus was to provide technical education, after high school, through various policies and commissions at different points of time. The Ministries of Education, Labour, Industry and Commerce besides the Central Advisory Board of Education (CABE) were involved in the exercise.

For catering the constant demand for vocational education in 1948–49, the University Education Commission recommended that students completing tenth grade in vocational education could take admission in the newly-constructed intermediate colleges, The objective was to cater to the demand for vocational education with employment skills also keeping pace with the general education for higher education. Later in 1952, Mudaliar Commission also recommended that the student have the option for taking up the vocations with diversification of the courses at the secondary as well as post- secondary level. This was further reinforced in the Education Commission 1964–66 with reference to the importance of vocational education and suggested two distinctive streams at higher secondary stage: one to prepare students for advance studies at universities and professional colleges and, second, to prepare students for a variety of occupations. It insisted that work-experience should be introduced as an integral part of all education and these recommendations led to policy formulation in 1968 and 1986 on vocationalisation of school education under the MHRD.

The centrally sponsored scheme of *Vocationalisation of Higher Secondary Education* was launched in 1988 to cover 10,000 schools with intake capacity of about ten lakh students. The scheme was revised in September 2011 as *Vocationalisation of Secondary and Higher Secondary Education* to meet the demand for highly skilled human resource for the national and international markets. In April 2013, the scheme was merged under the *Rashtriya Madhyamik Shiksha Abhiyan* scheme. Some of the significant amendments were introducing the vocational education from Class IX onwards, with increased financial provisions, for inviting resource persons and engaging with the Industry/Sector Skill Councils (SSCs) for assessment, certification and training. The status of vocational education in Table 1 illustrates the gap between the sanctioned schools and the implementation.

Table 1 Status of vocational education

S. No.	State	Number of schools approved								Number of schools implemented
		2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	Total	
1	Andaman & Nicobar Isles	0	0	0	0	5	12	4	21	17
2	Andhra Pradesh		26	0	0	0	100	80	206	126
3	Arunachal Pradesh	0	0	10	11	0	78	0	99	21
4	Assam	59	0	0	0	95	0	100	252	154
5	Bihar	0	0	38	0	0	0	0	38	0
6	Chandigarh	0	0	5	1	4	2	2	14	12
7	Chhattisgarh	0	0	25	0	96	270	100	491	391
8	Dadra and Nagar Haveli	0	0	0	0	2	2	0	4	0
9	Daman and Diu	0	0	0	0	2	3	0	5	2
10	Delhi	0	0	22	0	0	0	0	22	22
11	Goa	0	0	0	37	38	3	0	78	78
12	Gujarat	0	0	0	0	20	0	0	20	0
13	Haryana	40	0	100	100	250	500	11	1001	990
14	Himachal Pradesh	0	100	0	100	300	467	23	873	850
15	Jammu and Kashmir	0	0	22	110	0	220	0	352	132
16	Jharkhand	0	0	0	0	53	107	55	215	160
17	Karnataka	0	250	0	0	0	0	0	100	100
18	Kerala			0	0	0	0	20	20	0
19	Madhya Pradesh	0	0	50	0	0	263	313	626	313
20	Maharashtra	0	0	0	347	0	164	10	516	479

(continued)

Table 1 (continued)

S. No.	State	Number of schools approved								Number of schools implemented
		2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	Total	
21	Manipur	0	0	9	30	0	3	0	42	42
22	Meghalaya	0	0	0	0	5	5	3	13	0
23	Mizoram	0	0	0	0	10	1	3	14	11
24	Nagaland	0	0	5	0	0	5	1	11	10
25	Odisha	0	0	30	0	0	178	106	314	208
26	Punjab	0	0	0	100	300	380	0	780	400
27	Rajasthan	0	0	0	70	220	380	50	720	670
28	Sikkim	0	44	0	8	12	57	0	121	121
29	Tamil Nadu						67	0	67	0
30	Telangana	0	20	0	0		100	72	192	120
31	Uttar Pradesh	0	100	0	0		100	0	200	189
32	Uttarakhand	0	0	11	33	36	120	0	200	0
33	West Bengal	93	0	0	0	196	211	100	600	500
	Total	192	540	327	947	1644	3798	1053	8227	6118

Source http://www.rmsaindia.gov.in/en/component/pdf/__recentdocs.html?catid=199&main=199&Itemid=224&type=-1
Inclusive of higher secondary schools

Table 2 Vocational schools in India (IX–X)

S. No.	State name	2015–16	2016–17
1	Andaman and Nicobar Islands	13	20
2	Arunachal Pradesh	21	8
3	Assam	83	150
4	Bihar	1	1
5	Chandigarh	10	12
6	Chhattisgarh	85	404
7	Goa	77	71
8	Gujarat	8	0
9	Haryana	490	990
10	Himachal Pradesh	553	888
11	Jammu And Kashmir	131	343
12	Jharkhand	18	1
13	Karnataka	7	0
14	Kerala	32	0
15	Madhya Pradesh	65	260
16	Maharashtra	369	430
17	Manipur	0	1
18	Meghalaya	10	0
19	Mizoram	10	27
20	Odisha	3	1
21	Puducherry	1	0
22	Punjab	482	471
23	Sikkim	63	0
24	Telangana	5	0
25	Uttar Pradesh	13	0
26	West Bengal	0	6
	Total	2550	4084

Source Computed from UDISE data

Another major change was the introduction of the National Vocational Education Qualification Framework (NVEQF) in 2012. NVEQF is a descriptive framework that organises qualifications according to a series of levels of knowledge along with skills with the aim of integrating general academic education, vocational education, vocational training and higher education as a comprehensive system. The number of vocational schools have been increasing due to the change in economy which is creating demand for skilled persons (Table 2).

2 Vocational Education Under Five Year Plans: A Review

Education policies addressed the major issue of providing employment to all with the continued efforts in expanding the choices in vocational education along with the option for higher education. Initially, the vocational education in school was known as Work Education from Grades I to VIII for introducing the concept of work. Pre-vocational education is imparted in Grades IX–X (secondary level) with a view to providing the students a measure of familiarity with the wide spectrum of the world of work. In Grades XI–XII, which is the higher secondary level, distinct streams are introduced. Consequently, the Government of India took various measures to make the country self-reliant by way of massive economic and industrial development through its Five Year plans.

Tracing the journey of vocational education in secondary schools through the lens of five year plans is crucial for assessing its implementation and development. In the first five year plan, the focus was to provide a vocational bias based on the Directive Principles of the State Policy as per the constitutional provisions and approved schemes. It further states that the present education system does not provide scope for children who have a practical approach towards learning. The five year plan also mentions that "suitable types of multilateral or unilateral schools offering parallel courses should be provided and the personnel for vocational guidance should be trained. The standards to be attained should be high enough, … majority of students whose education ends at the secondary stage to be efficient workers and ….". The most significant statement to be considered is 'Secondary education is regarded as the weakest link in the educational chain and an expert examination of its problems has become overdue' (GoI 1951, p. 223). Thus, it was stated that secondary education needs special planning as it is the link between the basic and the higher education.

During the second five year plan, a comprehensive review of the issues related to the secondary education in 1953 reported the need to overhaul the curriculum as it was not related to the child's experience. Thus, it was proposed to engage substantial numbers of skilled workers, technicians and specialists in specific vocations. The budget for the technical and vocational education doubled from 230 million from the previous plan period to 480 million (GoI 1956, p. 500). The proposal was to achieve the development goals by focussing on the education provided to the children in the 14–17 years' age group. For this purpose, the courses and training were to be designed according to the child's aptitude and capacities. During the previous plan, 250 multi-purpose schools were started and it was expected to be increased to 1187 during the second plan for imparting diversified vocational courses. It must be pointed out that the focus in this plan was 'to develop agriculture at the secondary stage in rural areas…provide additional 200 agricultural courses' (GoI 1956, p. 510).

The five year plan also proposed setting up of junior technical schools for general and technical education along with workshop training for a period of three years for boys in the age group of 14–17 years. It also recommended attending to the requirement of training of the secondary teachers in vocational courses. The Ministry of Education also recommended having a programme for training 500 degree teachers

and 1000 diploma teachers for multi-purpose and junior technical schools. State Plans provided Rs. 460 million for the reorientation of secondary education for providing educational and vocational guidance (GoI 1956, p. 510).

The Third Plan focussed on expanding the reach of quality vocational guidance programmes among the students, with an emphasis on consolidation and improvement of all aspects of secondary education reorganisation. The observations were recorded regarding the difficulties in the functioning of the multi-purpose schools. As discussed earlier, 2115 multi-purpose schools were established that offered practical courses in Technology, Agriculture, Commerce, Home Science and Fine Arts in addition to Humanities and Science. But the major issue was related to the lack of trained teachers and teaching material for these courses. The plan proposed to consolidate the scheme by strengthening the established schools and limiting the expansion for only 331 schools. The focus was on integrated teacher training programme for which four regional training colleges were proposed to be set up to 'prepare teachers for the multi-purpose schools through in-service and pre-service training programmes to stimulate greater experimental work for providing courses of study suited to different levels of ability, including special programmes of education for gifted students' (GoI 1961). The Fourth five year Plan reinforced the need to provide skills to students after elementary schooling with reference to the new demands (GoI 1967).

The following plan also proposed that 'vocationalisation at the secondary stage will be initiated in selected areas during the next two years so that well-conceived and fully thought-out programmes are implemented' (GoI 1973). A similar trend was also followed in the sixth five year plan, which merely focussed on designing the model for linking the vocational education with the employment opportunities. It was proposed to carry this out through the 'detailed surveys of existing and potential work opportunities and of available educational and training facilities. It should also keep in view the specific roles and responsibilities of the different agencies and ensure coordination at the operational level between the developmental programmes and the educational system' (GoI 1981). The focus was to establish linkages with different agencies for practical experience in the vocational skills, namely *Krishi Udyog, Van Vikas* and vocational training centres and the new facilities need to be created only in the rural areas. This programme made limited progress, with an enrolment of about 55,000 students in vocational education, confined to nine States and three Union Territories where it had been introduced.

The Seventh five year plan opined that the 'socially useful productive work (work experience) programme component …. Besides, the support system for development, training, management and supervision available for vocationalisation programmes, will also be utilised for the programme of socially useful productive work at the secondary stage. Some courses/activities of pre-vocational character will also be introduced for more effective implementation of this programme' (GoI 1985). Thus, the major focus was provided on vocational education in the higher secondary schools by ensuring that there is no overlap of the courses between technical and vocational institutions and the schools. It also stated that vocational education courses are to be initiated in a flexible manner, linking with the upcoming job opportunities. The

success of vocational education scheme can be achieved only through collaboration with the States, for which an expert committee was set up for expanding the programme in coordination with the education system.

The following plan coincided with the liberalisation of the economy that marked the expansion of the education system in the country. The vocational education scheme was revised, and it was reported that 'By the end of 1991–92, about 8.7% of the higher secondary students (5.85 lakhs) would have been diverted to vocational stream… education would be linked to the world of work … improving the quality of vocational education' (GoI 1992). In the Eighth five year plan, the National Open Schooling (NOS) was made responsible for introducing and developing courses for vocational education for 'health, agriculture and rural development in collaboration with the concerned departments'. It also focussed on the courses which could be flexible and need-based, catering to the disadvantaged groups. At this point, it was suggested 'experimental projects with other vocational education models are also tried out, e.g. pre-vocational education at the lower secondary level…involve major industrial houses … services of commercial agencies and NGOs will also be utilised' (GoI 1992).

The Ninth five year plan recorded that 'secondary education curricula continue to be liberal and oriented to the first degree courses, in spite of the strong advocacy in favour of vocationalisation and investments made to divert students to vocational courses' (GoI 1999). It emphasised on pre-vocational training at the secondary level for industrial and agricultural development with practical training. In 1993–94, pre-vocational training to students enrolled at the secondary stage was initiated and the programme of vocationalisation was extended to 6476 schools during 1995–96 with a share of 11.5% of students in the vocational streams. But it must be noted that 'in spite of creating capacity for diversion of 11.5% secondary pass students to vocational courses, only 4.8% students could be diverted' (GoI 1999). The NOS contributed to vocational education by developing '23 secondary courses including vocational courses in the areas of Agriculture, Commerce and Business, Technology, Para-medical and Home Science… 105 are vocational study centres' (GoI 1999).

Basic premise for introducing the vocational education scheme was to divert at least 25% of school students in self-employment but only 4.8% of students opted for it against the 25% target. The scheme required a huge pool of academic expertise and logistical support along with strong linkages between the industries and institutes. Thus, it became pertinent to revise the scheme with the provision for providing employability to the target group, based on the coordination among different departments of the various ministries. The plan outlay of Rs. 1000 million was provided under the vocational education scheme.

By Tenth plan the vocational education rolled out was functional in 6700 schools offering more than 150 courses in six major disciplines: agriculture, business and commerce, engineering and technology, health and para-medical services, home sciences and humanities. With so many courses, there is a need to collaborate with various ministries, private sector and NGOs for providing training for hands-on experience as well as financial support for setting up personal ventures. It was also reported that for promoting vocational education, around 168 NGOs were provided

financial assistance for designing innovative programmes for rural unemployed youth and school drop-outs. This was proposed due to partial success of the vocational education scheme at the secondary stage as students preferred to opt for general education whereas the need was for skilled and technical human resources with the change in the economic scenario due to liberalisation (GoI 2002). The demand and need-based approach to the vocational education was emphasised with flexibility 'to allow students to switch courses with changes in demand patterns' (GoI 2002). It also recommended involvement of industries and professional institutes in designing, training and certification of courses. The convergence of different programmes was also mentioned as the State scenarios were different and there was a need to contextualise the course with the demand for regular updation of the curriculum. The need for training vocational education teachers was reinforced with a need to create platforms for sharing ideas between trainers and trainees. Involvement of industry associations like Federation of Indian Chambers of Commerce and Industry (FICCI), Associated Chambers of Commerce and Industry (ASSOCHAM) and Confederation of Indian Industry (CII) was also suggested for imparting skills.

Eleventh five year plan introduced the concept of National Vocational Qualification (NVQ) system that was to be developed in collaboration with public and private sectors to cater to the demand of the industry and the individuals. Central Institute of Vocational Education (PSSCIVE), Bhopal served as the national resource institution for policy, planning, and monitoring of vocational programmes. NVQ was in the form of modular competency vocational education with a mechanism of testing skills. SCERTs, DIETs and BRCs were to extend an integrated institutional mechanism for effective implementation of vocational programmes in convergent mode. The proposal was to cover 20,000 schools by 2011–12 while so far 9583 schools were created (GoI 2008).

In the Twelfth Plan, 'a mechanism was created for convergence of vocational courses offered by various ministries, private initiatives and vocational education institutions, and use schools as the outlet for vocational education of young people' (GoI, 2012). The vocational education scheme was reviewed and supported by National Vocational Education Qualifications Framework (NVEQF) for smooth transition from school to higher education 'and provide more options to students to choose vocational modules depending on their aptitude and economic requirements' (GoI, 2012). Competency-based modules were developed for vocational courses and a pilot programme, within the NVEQF, in 40 pilot schools in eight districts of Haryana to about 400 schools by 2013–14. An MIS and web portal on vocational education to share best practices and experiences was proposed. The emphasis was to develop skills in the formal education from Grade IX onwards and a vocational education cell has been established within the CBSE. Based on the CBSE-NIOS collaboration model, the States were also supported for setting up similar cells in the State Boards. The model allowed the credit accumulation and transfer for accelerated participation of students to opt for vocational courses along with academic courses either as combination subjects or additional subjects. For quality assurance, the course design and TLM development was to get decentralised while PSSCIVE got responsibility for quality assurance in vocational education.

Analysis of all the five year plans on vocational education exemplify that since 1950s with the first Five Year Plan (1951–56), vocational education as a programme has been considered a very crucial area at the secondary level as it is a link between primary and higher education. The same idea prevailed with the subsequent plans until the nineties when the National Policy on Education (NPE), 1986 brought vocational education at the centre stage. In 1995–96, vocational education programme was expanded, but it had a very tepid response from the students in spite of the provisions made for pre-vocational training, pointing towards a relook at the programme.

3 Translating Plans into Reality: Pragmatic Outlook

The vocational education has been a very complex area for deeper interventions with a blanket approach as there are many skills transacted in the limited scope of streams. From the previous sections, it is evident that there had been no demand for vocational education due to which its expansion had been very limited. Figure 1 illustrates the major landmarks in the field of vocational and skill education, based on the education policies and the developments specific to it.

As mentioned earlier, vocational education falls under the purview of the Ministry of Human Resources Development (MHRD). The All India Council for Vocational Education (AICVE), under MHRD, is responsible for planning, guiding and coordinating the programme at the national level while State Councils for Vocational Education (SCVEs) execute it at the State level (Prasad et al. 2010). The vocational education programme was initiated with a view to reducing the pressure on higher education by diverting 50% students who complete Grade X, according to the NPE, 1968. In

Fig. 1 Landmarks in development of vocational education

1970, very few States and UTs accepted the vocational education and by 1976, the National Council of Educational Research and Training (NCERT) document, *Higher Secondary Education and its Vocationalization*, prepared a model conceptual framework for implementation across the nation (Pilz 2016). Subsequently, the National Policy on Education 1986 pointed towards the systematic and well-planned reorganisation of vocational education as a stream offering different vocations. In 1988, the National Working Group on Vocationalisation of Education (also known as the V.C. Kulandaiswamy Committee) reviewed the Vocational Education Programme and prepared the guidelines for expansion of the programme. Based on its recommendations, a centrally sponsored scheme was implemented in the States and UTs, both in the formal and non-formal sectors.

The vocational education scheme focussed on providing diversified educational opportunities, besides reducing the gap in demand for supply of skilled persons while providing an alternative for higher education. Initially, the scheme was for two years at the higher secondary stage and later, based on the report of the evaluation study, it was suggested that vocational education needs to be of a longer duration. In 1995, the Central Board of Secondary Education (CBSE) introduced pre-vocational education scheme for providing basic skills to Classes IX and X students.

Over 2009–10, the scheme was completely revamped, and was implemented from April 2011, but on an extremely small scale because 2011–12 was the final year of the Eleventh Plan. In the beginning of the Twelfth Five Year Plan from April 2012, along with the National Qualification Framework (NQF), various bodies/committees for governance, monitoring and implementation were set up. The Central Board of Vocational Education (CBVE) and State Board of Vocational Education (SBVE) for accreditation/affiliation, examination, certification and equivalence was also formed, which in 2013, were subsumed under *Rashtriya Madhyamik Shiksha Abhiyaan* (RMSA).

The financial provisions for the scheme, which are shared by the Centre and the States, are varied as the Central government gives 100% assistance for 11 components: apprenticeship training, district vocational surveys, textbook development workshops, instructional material subsidy, resource persons training, workshop/laboratory building, equipment to schools, teacher training courses, curriculum development workshop, etc. While 50% assistance is given to the States for five components, viz. vocational wings at State Directorates of Education, SCERT vocational wings, district vocational wings, provision of raw material/contingency funds and field visits by students. The ratio of 75:25 is followed for sharing the financial responsibility between the Centre and the State for vocational school staff. The States completely finance the expenditure on conducting examinations and providing vocational guidance (GoI 2002).

In 2014, with the creation of Ministry of Skills Development and Entrepreneurship (MSDE), a unified policy on skills' sector was designed. Further, the formulation of National Policy on Skill Development and Entrepreneurship (NPSDE) 2015 was published. The main challenge that required to be addressed was that only 4.69% of the workforce was skilled. In this context, the 2016 budget illustrated the focus and direction of the government's policy on skills, including the announcement of

a new National Board for Skill. NPSDE focussed on global partnerships that were viewed as enablers for achieving the target by adopting the certification and assessment framework for quality assurance. In 2018, the Union Cabinet announced the merger of regulatory institutions National Council for Vocational Training (NCVT) and the National Skill Development Agency (NDSA) with the National Council for Vocational Education and Training (NCVET). It is expected that this would make vocational education a desired option for students and lead to the augmentation of skilled manpower in the country. But a mere change in the policies also needs to be clubbed with the expansion of the work market as the demand and supply of both the sectors needs to be balanced well to facilitate a major change.

3.1 Curriculum and NSQF

Vocational education Scheme recommends various career options in skills through Central Board of Secondary Education (CBSE) with 15 Vocational Courses in different sectors at Secondary level and 40 courses at senior secondary level. Many courses are offered, in collaboration with professional organisations, at the secondary level in a format wherein the vocational subject can be offered as an additional sixth subject along with the existing five academic subjects. Thus, if any student fails in any one of the three elective subjects (i.e. science, mathematics and social science), then this subject will be replaced by the vocational subject (offered as the sixth additional subject) and the result of Class X will be computed based on best five subjects. However, if a candidate desires to reappear in the failed subject, he/she may appear in the same along with the compartment examination. There is also a provision for opting for a seventh subject as optional, if vocational subject is taken as a compulsory one (CBSE website).

Overall, more than 100 job roles are covered under vocational education. In 17 sectors, a four-year curriculum is offered for the students. Vocational education is also known as career and Technical Education (CTE) which prepares students in specific trades, involving various practical experiences, while learning. The National Skills Qualification Framework is followed for designing the curricular and learning outcome at the secondary level. The various sectors, offered to be transacted in the secondary schools, are the following:

- Agricultural: With the job role as annual health worker, dairy worker, nursery worker, paddy farmer, solanaceous crop cultivator
- Apparels, Made-ups and Home Furnishings: With the job role as Hand Embroiderer-Addawala, Sewing Machine Operator
- Automotive: With the job role as automotive service technician L-3
- Banking, Financial Services and Insurance (BFSI): With the job role as Business Correspondent (NA)
- Beauty and Wellness: With the job role as Assistant Beauty Therapist
- Construction: With the job role as Assistant Mason

- Electronics and Hardware: With the job role as Field Technician-Other Home Appliances
- Information Technology (IT)/IT-enabled Services (ITeS): With the job role as Domestic Data Entry Operator
- Retail: With the job role as Store Operations Assistant
- Physical Education and Sports: With the job role as Physical Trainer/Teacher
- Plumber: With the job role as Plumber-General
- Power: With the job role as Consumer Energy Meter
- Private Security: With the job role as Unarmed Security Guard
- Telecom: With the job role as optical fibre Splicer
- Tourism and Hospitality: With the job role as Housekeeping Attendant-Manual Cleaning: Food and Beverage Service Trainee
- Transportation Logistics and Warehouse: With the job role as Consignment Tracking Executive, Warehouse Packer.
- Multi-skilling: With the job role as Multi-Skill Technician Course (NA).

NVEQF, piloted (in mid-2012) in two States (Haryana and Assam), was replicated in over 1000 schools in India. The main features of the NVEQF are to involve the private sector, in the form of Sector Skills Councils (SSCs), being sponsored by the National Skill Development Corporation (NSDC), in TVET; courses to be offered from Grade IX; adopting of semester system with credit accumulation; and teaching/training to be based on national occupation standards for each level of vocational education and training for individual skills. The timeframe for implementing the NVEQF was 2017, with the provision of student mobility from vocational to general education and vice versa. The modular courses provide an option to the student for undertaking the higher education with an expectation of increased demand for vocational education (GoI 2013). Academic qualifications were to be assessed and certified by educational bodies and vocational skills would be assessed and certified by respective SSCs. It is, essentially, a quality assurance framework which unifies the National Vocational Qualification Framework (NVQF), developed by the MoLE, and the National Vocational Education Qualification Framework (NVEQF), developed by the Ministry of Human Resource Development (MHRD). The NVEQF has been aligned to NSQF and has been introduced in 2035 schools all over India under the scheme 'Vocationalisation of Secondary and Higher Secondary Education'.

A review of the project of NVEQF in 40 schools in Haryana (2012–13) by the MHRD recommended that vocational education and training should be mainstreamed to increase the number of participants, industry and jobs should drive types of vocational training given, core employability skills should be made essential across sectors and skill analysis need to be conducted. Recognition of Prior Learning (RPL) is a very important associated function of the NSQF (GoI 2013). Based on the notification of NSQF, the NSDA took up pilot projects in select sectors (Agricultural, Capital Goods, Construction, Domestic Workers, Gems and Jewellery, Health care) for RPL along with National Institute of Open Schooling and other important stakeholders. The NSQF curriculum offers courses in 17 sectors, catering to 103 job roles for Grades IX and X.

Table 3 Number of schools with enrolment, 2014–15

State/Board	Schools	Sectors	Expected number
Haryana	240	Auto, Healthcare, Retail, Security, IT-ITeS, Beauty and Wellness and Sports	23,000
Himachal Pradesh	200	Auto, Healthcare, Retail, Security, IT-ITeS, Agriculture	18,000
Uttarakhand	44	Auto, Healthcare, Retail, IT-ITeS	5000
Madhya Pradesh	50	Auto, IT-ITeS	2500
Punjab	100	Auto, Retail, IT/ITES, Security, B&W and Healthcare	5000
Rajasthan	70	Automotive, Gems and Jewellery, Healthcare, Travel & Tourism and Beauty and Wellness	3500
Maharashtra	350	Auto, Healthcare, IT-ITeS, Construction, Capital Goods	15,000
Nagaland	6	IT-ITeS	300
Karnataka	100	Auto, Healthcare, IT-ITeS, Retail	15,000
Chhattisgarh	30	Automotive, Retail and IT-ITES	2000

Source https://www.msde.gov.in/school-education.html

NSDC in 2014–15 worked with the State Governments of Haryana, Himachal Pradesh, Karnataka, Punjab, Uttarakhand, Madhya Pradesh, Nagaland, Maharashtra, Chhattisgarh and Rajasthan for implementation of the scheme in their respective States through its approved and funded Sector Skill Councils (NSDC website). SSCs maintain the link for Identification of Trades/Occupations, Accrediting curriculum with PSSCIVE, Recommendation for Appointment of Vocational (Industry) Coordinator, Quality Control of Training, Training of Trainers, Student Assessment and Certification and Industry Interface. SSCs also conduct assessments and provide certification aligned to the National Skill Qualification Framework (NSQF) along with the State Education Board (Table 3).

The formation of 40 SSCs was to ensure that the qualifications framework, approved by the NSDC for different sectors, was reviewed by the government for preparing the roadmap to develop skills network (GoI 2016).

4 Issues and Challenges

The success of vocational education scheme depends on four major premises: support from the State, curriculum, teacher or resource persons and inter-Ministry/Department collaboration. The first premise of State collaboration was very limited till the Sixth five year plan but, with the formulation of NPE, 1986 and the revision of the scheme with financial support from the Centre, the scheme was extended/expanded in many States. Currently, vocational education scheme has

been merged with RMSA (now *Samagra Shiksha*) due to which the supply side of the scheme was assured but quality aspect is equally critical. The evaluation of vocational education scheme at various points of time in 1996 and 1998 illustrates that the States relegated vocational education to the lowest priority, with the scheme functioning in isolation.

The second premise regarding curriculum needs to be fine tuned with the NVEQF. It adopted a flexible model for incorporating the vocational education within the mainstream education. The PSSCIVE, as the nodal institution, developed the courses in major vocational sectors. Since the curriculum is diversified on demand basis for specific sectors, it becomes difficult to execute it due to lack of physical and academic resources. The syllabi of vocational courses are to be competency-based in modular form with a credit transfer system and provision for multi-point entry/exit, as per the recommendations. However, in practice, managing such a system is quite challenging as every course has a different need for executing it along with attendant practice sessions. The competencies in sync with the NVEQF need to be assessed separately, and this process is not only time consuming but also requires additional resources.

Thirdly, lack of mechanism for appointing full-time teachers for different vocations, as is the case with curriculum discussed above, makes this vocational education scheme less attractive for the States. In spite of the funding from the Centre, the State governments do not appoint full-time teachers to avoid the risk posed by non-continuation of the scheme, even though there is a huge requirement of teachers or resource persons as many courses are offered in various sectors. The issue of teacher training is also an area of concern as since the courses are practical based, the uniformity in the process of training or induction schedule is a challenge.

Further, the focus areas for the vocational education schools being in the rural pockets also, at times, adds to the scarcity of trainers. The selection of schools needs to ensure that all the districts are covered, with particular emphasis on Special Focus Districts (SFDs), including districts affected by Left Wing Extremism (LWE) besides schools located in the Educationally Backward Blocks (EBBs). The selection of schools and trades should be based on the proximity of schools to industry and the placement opportunities for students. Each school needs to select two Vocational Trades on the basis of the Skill Gap Analysis, conducted by National Skill Development Council (NSDC). The share of the disadvantaged groups enrolling in the vocational education can also be analysed as access to vocational education is focussed on the less developed regions as per the vocational education scheme (Tables 4 and 5). Haryana, Himachal Pradesh, Maharashtra, Jammu and Kashmir and Punjab had the maximum number of vocational schools. Among the SC enrolment, the highest number of students were from the States of Punjab and Haryana while, for the ST group, the highest enrolments were in the States of Arunachal Pradesh and Mizoram.

The UDISE data related to the streams offered by schools in the States for the years 2015–16 and 2016–17 revealed that in Haryana, the number of schools offering Beauty and Wellness vocational course increased from 110 to 167, whereas in Punjab, it dropped from 48 to 40 schools. In so far as agriculture stream was concerned, the schools offering the related course increased from 75 to 93 in Himachal Pradesh,

Table 4 Enrolment of scheduled castes children in secondary schools (%)

S. No.	State	Total number of schools		Boys in class IX		Girls in class IX		Boys in class X		Girls in class X	
		2015–16	2016–17	2015–16	2016–17	2015–16	2016–17	2015–16	2016–17	2015–16	2016–17
1	Assam	59	20	10.66	8.95	10.50	12.68	13.85	5.39	8.11	8.30
2	Chandigarh	10	4	22.76	0.00	19.10	0.00	25.89	0.00	18.28	0.00
3	Chhattisgarh	85	395	16.10	14.75	12.86	15.20	20.30	19.14	18.86	14.79
4	Goa	76	68	3.38	4.58	4.65	3.68	1.94	2.75	4.47	4.31
5	Haryana	490	983	40.95	44.82	39.52	42.18	39.82	38.42	37.40	37.50
6	Himachal Pradesh	503	852	35.41	35.45	34.00	35.19	35.27	34.99	33.16	32.91
7	Jammu And Kashmir	115	324	0.00	5.38	0.00	3.38	0.00	0.00	0.00	2.17
8	Jharkhand	13	0	5.07	0	1.90	0	0.00	0	0.00	0
9	Madhya Pradesh	44	245	21.53	22.80	19.03	17.03	19.73	18.57	14.75	18.31
10	Maharashtra	275	356	16.09	20.53	20.50	22.06	15.46	21.37	16.91	23.43
11	Mizoram	10	11	0.00	5.19	0.00	4.35	0.00	0.00	0.00	0.00
12	Punjab	403	405	60.48	62.36	62.90	63.46	55.60	58.18	58.18	62.15
13	Sikkim	63	0	7.91	0	8.16	0	6.92	0	6.85	0
14	Uttar Pradesh	5	0	17.89	0	14.18	0	14.16	0	10.77	0

Source Computed from UDISE data

Table 5 Enrolment of scheduled tribes children in secondary schools (%)

S. No.	State name	Total number of schools		Boys in class IX		Girls in class IX		Boys in class X		Girls in class X	
		2015–16	2016–17	2015–16	2016–17	2015–16	2016–17	2015–16	2016–17	2015–16	2016–17
1	Andaman and Nicobar Islands	5	17	1.35	26.09	3.80	24.20	0.00	0.00	0.00	0.00
2	Arunachal Pradesh	21	2	82.45	60.00	87.36	84.62	76.92	82.14	75.00	90.91
3	Assam	59	20	9.61	5.00	12.54	12.32	0.00	4.04	6.76	5.28
4	Chhattisgarh	85	395	28.78	33.38	26.58	30.76	24.84	27.94	26.29	24.72
5	Goa	76	68	21.77	20.44	25.04	24.14	22.10	23.65	21.82	24.28
6	Haryana	490	983	0.00	0.13	0.00	0.49	0.00	0.13	0.10	0.45
7	Himachal Pradesh	503	852	5.76	5.73	6.06	6.21	7.07	5.44	8.34	5.90
8	Jammu And Kashmir	115	324	0.00	9.20	0.00	7.03	0.00	27.54	0.00	21.20
9	Jharkhand	13	0	41.06	0	32.38	0	0.00	0	0.00	0
10	Madhya Pradesh	44	245	18.51	25.06	15.92	24.06	16.35	14.63	10.75	11.62
11	Maharashtra	275	356	46.15	26.73	30.21	28.05	15.46	24.42	37.17	25.96
12	Mizoram	10	11	100.00	93.94	100.00	95.26	0.00	100.00	0.00	100.00
13	Punjab	403	405	0.24	0.01	0.03	0.06	0.00	0.04	0.00	0.05
14	Sikkim	63	0	34.54	0	38.10	0	33.69	0	36.71	0

Source Computed from UDISE data

16 to 46 in Haryana during the same period while, in Punjab, the schools decreased from 57 to 52. There was a huge jump in the number of schools offering Healthcare stream in Chhattisgarh from 14 to 168 while, in Haryana, the corresponding increase for the stream was from 94 to 134 schools. In the same stream in Himachal Pradesh, the number of schools rose from 100 to 131 but the maximum rise was in Jammu and Kashmir—from 56 to 124. In IT and IT-Enabled Services, the number of schools in Chhattisgarh, increased from 55 to 79; in Haryana from 60 to 232; in Himachal Pradesh, from 38 to 60 and, in Jammu and Kashmir, it increased to 29 from none. In the Sports stream, the number of schools in Haryana increased from 69 to 116 (UDISE Raw Data, 2018).

Further, due to lack of coordination between different Ministries and departments, vocational education could not create the expected demand in the education system. The linkage of secondary education with higher education and industry, from where the demand is generated for skilled human resources, is quite weak. There is still a different treatmential with reference to where the stream of programme is undertaken, namely general or vocational education. It is proposed that vocational courses should be provided in general schools in active partnership with industry and close collaboration with the Block-Level Vocational Institutions (BLVI), established in rural areas. A proposal was also made for charging fees and evolve self-financing mechanisms for sustaining the scheme.

The lack of cooperation between institution and industry entailed a lack of incentives to attract the private players. To add to it, there was a shortage of skilled trainers and teachers coupled with a lack of provision for training and continuous upgradation of teachers in different vocations. Likewise, there was also a lack of student mobility from one sector to another. As such, in order to address these issues, it is imperative that the collaboration between NOS and the formal sector be of a complementary nature to enable having vocational courses that will make the desired impact while conforming to quality requirements. The National Skill Development Corporation India (NSDC), as a response to these concerns, was set up in 2008 as a public–private partnership Company with the primary mandate of catalysing the skills' landscape in India. NSDC is a unique model, based on the pillars of create; fund; and enable, for meeting international standards in collaboration with the industries. SSCs, set up as autonomous industry-led bodies by NSDC, created the occupational standards and framework on curriculum aligned to national standards. NSDA, established in 2013, had an impact on school education as it gave an impetus to vocational education. Simultaneously, the impact of other programmes like the *Sarva Shiksha Abhiyaan* (SSA), launched in 2000, *Rashtriya Madhyamik Shiksha Abhiyaan* (RMSA), launched in 2009, and the Right to Education Act, 2010 (RtE) also had an impact on the design and implementation of the vocational education scheme. For instance, it was observed that there was an urgent need to accommodate all the pass-outs from these schemes in the skill sector so that they could gain the skills required for leading a self-sustainable life.

Despite many efforts, the vocational education is still quite limited, with only a few options for upward mobility in the selected skills through advanced courses. Modular courses, with the integration of technology and incorporating practical

knowledge, with learner-centric approach, is yet far to be achieved. Besides, it needs to be further strengthened by better linkages with industry and employers, updated curricula and teacher-training programmes (Mehrotra 2017). The financial support needed for upgradation of facilities necessary for vocational education to attain world standards is enormous. The students, opting for vocational education in schools, are usually from the rural areas and from the disadvantaged groups for whom the need-based skills will be relevant.

5 Way Forward

While exploring the process of design and implementation of vocational education, this paper reveals that vocational education had been a part of twists and turns since its inception. The changing economic and demographic landscape, in the Indian context, requires a fresh approach towards education planning. The process of development happens simultaneously with these changes, if addressed at the right time and with the right approach. The vocational education had always been an integral part of the education system but had not made any significant demand for the vocational streams. It was assumed that vocational education would automatically have a greater demand than higher education, given its orientation towards skill acquisition for employability.

The analysis of implementation also illustrates that the demand and supply link had been weak and, thus, it remained quite limited in its ambit and approach. Initially, the scheme covered higher secondary schools, but later on, it was extended to the secondary schools. The review of educational policies and committee reports with reference to vocational education, highlights the increasing demand of skill development in nineties due to economic liberalisation. However, the same demand was not reflected in the vocational education which was designed to provide opportunities for self-employment through it. The NIOS also provides the vocational education through the distance mode in different vocations.

Education is the means of reaching the development goals while vocational education is the process for attaining it. The dynamics and challenges of the global economic process can be addressed by NSQF (established in 2013), followed by the National Policy on Skill Development and Entrepreneurship (in 2015) and, in 2018, by the National Council for Vocational Education and Training (NCVET). It is expected that the focus on developing vocational education would be instrumental in attaining the goal of 'employment for all' in sync with the Sustainable Development Goals.

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