CESS-RSEPPG Background Paper Series #3

Skill Development in India

A Conceptual Framework Mapping Educational (and Training) Outcomes and Occupation-Job-Skills Standards of Industry and Labour Market

Venkatanarayana Motkuri and E. Revathi

Research Cell on Education (RSEPPG)
Centre for Economic and Social Studies
(ICSSR, Ministry of Education, Government of India)
Hyderabad-16

January 2021

Research Cell on Education

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Contact Details:

Research Cell on Education
Centre for Economic and Social Studies
(ICSSR, Ministry of Education, Government of India)
N.O. Campus, Begumpet,
Hyderabad – 16

Phone: 040 2340 2789 / 23416780 / 23416610-13
post@cess.ac.in

https://cess.ac.in/

Citation:
Motkuri, V. and E. Revathi (15 January 2021). ***Skill Development in India: A Conceptual Framework Mapping Educational (and Training) Outcomes and Occupation-Job-Skills Standards of Industry and Labour Market****, CESS-RSEPPG Background Paper Series #3*, Research Cell on Education (RSEPPG), Centre for Economic and Social Studies, Hyderabad.

Skill Development in India: A Conceptual Framework Mapping Educational (and Training) Outcomes and Occupation-Job-Skills Standards of Industry and Labour Market

Venkatanarayana Motkuri and E. Revathi[#]

Abstract

The present paper develops a conceptual framework understanding the skill development sector, its policy and relational mapping of the educational outcomes and occupation-skill-standards of industry while examining the policy framework for vocational education and skill development in India.

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I Context

There is a longstanding inconclusive debate and discussion on what should be the aim of education system, whether tailored accordingly to catering the needs of labour market requirements i.e. supplying skilled labour (career oriented), or advancement of human knowledge. In the midst it is considered that while the foundation for learning is to be laid in the basic level of education (below secondary), secondary and tertiary levels of education are to develop core capabilities and technical skills that serves labour market needs (World Bank, 2008). Further, vocational education and training as a separate stream (at secondary and post-secondary level) has been evolved to cater the immediate job market needs. However, the increasing mismatch between demand and supply of skilled labour is concerned with the quality of education and training (World Bank, 2013).

Along with *skill shortage*, ***skill gap/deficit*** is a major issue in the labour market across the globe. Moreover, labour markets are facing certain uncertainty in anticipating fast changing skills and job roles in the context of the emerging knowledge based economies and fourth industrial revolution (Industry 4.0) with unimaginable multitudes of technological innovations. Despite the remarkable progress in access to education at all levels across countries, *learning crisis* is a global phenomenon (Panth and Maclean, 2020). The coexistence in the labour market of unemployment in the labourforce and shortage of labour for the industry have become a policy concern and resulted in emerging ***skill development sector*** and re-orientation of education and training system to match the learning outcomes and competencies with the skill content (requirements) of the job roles in the labour market (World Bank, 2013; UNESCO, 2012).

The human capital perspective of education that evolved since mid-1950s along with the screening hypothesis of job market signalling theory since mid-1970s and new growth theory

[#] **Venkatanarayana Motkuri Ph.D.,** (venkatanarayan@gmail.com) is an Associate Professor and Coordinator of Research Cell on Education (RSEPPG), **E. Revathi** Ph.D., (revathi@cess.ac.in) is a Professor and Director, Centre for Economic and Social Studies (CESS), Hyderabad and also Overall Co-ordinator of RSEPPG. This Research Study at RSEPPG of CESS is conducted with financial support of the ***Telangana State Council for Higher Education*** (TSCHE).

since late-1980s have profound impact on the orientation and policy discourse on education (Schultz, 1961; Becker, 1964; Arrow, 1972; Spence, 1973; Layard and Psacharopoulos, 1974). However, pragmatically, it is a cause of concern for labour markets across the globe the widening gap between the educational development, learning outcomes and skill requirements of the growing industry with fast changing technologies. Skill gap studies have been indicating mismatch between the learning outcomes of the education and training systems and industry skill demand. Due to this mismatch, labour markets have been witnessing the educated unemployment as well as shortage of skilled labour at the same time, simultaneously. Although it appeared to be a global phenomenon, its intensity is observed to be relatively high in India which aspires to be one of the global leaders and economic power house along with China. But the cause of concern is its human capital base and skill level of its labourforce to lead the country' economy especially in the context of emerging knowledge-based global economy led by fast changing technologies.

Herein, harnessing demographic dividend with bulging young and working age population in India that witnessed during the last three decades, certain policy initiatives have been placed to cater the needs of industry, labour market and working-age population of the country (King, 2012; Mehrotra, 2014). Along with revamping the vocational education and training stream that has been continued since independence, there have been multi-dimensional interventions in the field of Indian skill development sector while involving multiple-players (private and public), as Providers, Standard setters and Assessors along with regulatory governance structures.

In this backdrop the present paper develops a conceptual framework in understanding skill development sector, policy and relational mapping of the educational learning outcomes (knowledge, skill, aptitude and competencies) and industry-occupation-skill standards of job roles of labour market.

II Perspectives of Education: Linking with Labour Market

As mentioned above, there has been a long standing inconclusive debate and discussion on idealistic and pragmatic nature of education whether it is in pursuit of pure knowledge and pleasure or to prepare the children and youth for the world of work with required knowledge and skill sets. Historically, the ancient Greek traditions of learning had focussed on liberal education imparting broad based knowledge, critical thinking and transferable skills whereas the Medieval and Modern era Utilitarians like John Locke and J.S. Mill had emphasised on development of vocational and technical skills (Lanford, 2019). The early 19th Century German-origin Humboldtian ideal of education especially at higher level, is meant to academic purposes. At the same historical time Napoleonic Education Reforms in France introduced a career oriented education from the secondary level (civil and military careers). In the United States of America, the Yale Report of 1828 had succinctly defended the liberal education and liberal arts programme with classical curriculum and classical languages (Rudolph, 1991). John Henry Newman in the mid-19th Century brought forth again the idea of liberal education (Lanford, 2019). At the turn of 20th Century, Emile Durkheim, French Sociologist and Functionalist, having had a proposition that education reflect the dominant ideologies of the times he discerned the critical role of education in transforming the modern society in

transmitting the shared values of society (social solidarity) and imparting skills for division of labour[1] (Williams, 2015; Thomson, 2017). The century-old American Association of Colleges and Universities (AACU) and its decade-old initiative, Liberal Education and American's Promise (LEAP), has been advocating the liberal education[2].

In the post-war development context, the Robbins' Report of UK in 1960s, and the Bologona Consensus of European Union since 1990s have drafted re-orientation of education system towards labour market requirements (Robbins, 1963; Gaston, 2010). The Robbins report of United Kingdom (UK) said that the instruction in skills play significant role in general division of labour especially in the context of fast changing technologies the economic progress that depends to a greater extent on skills that require certain special training (Robbins, 1963). Development economist Harvey Leibenstein in this regard in his study made an observation that a type of education that contribute to skills and/or that add to the stock of entrepreneurial talent is likely to contribute to economic growth (Leibenstein, 1967: 52).

Further, there is an economic perspective of education evolved beginning with classical economist Adam Smith to post-war development economists and human capital theorists T.W. Schultz and Gary Becker and to recent New Growth theorist Paul Romer and Robert Lucas (Schultz, 1961; Becker, 1964; Blaug, 1972; Romer, 1986; 1994; Lucas, 1988). While the Solow's growth accounting method has laid foundation in evolving the human capital perspective of education, the Jacob Minicer's equation and estimates of differential earning by level of education along with growth decomposition exercise carried out by Edward Dennis, Dale Jorgenson and Zvi Griliches followed by subsequent studies on returns to education George Pscharopoulos and others have validated and substantiated with their empirical research studies (Solow, 1957; 1962; Mincer, 1958; 1964; Denison, 1962; 1967; Griliches and Jorgenson, 1966; Jorgenson and Griliches, 1967; Psacharopoulos, 1967; Layard and Psacharopoulos, 1974; Blaug, 1976; 1985; Psacharopoulos and Patrinos, 2004). Human capital is an embodiment of skills and knowledge in the humans (Rumberger, 1981). The economic impact of education on growth was seen through labour market outcomes especially the labour productivity and individual earnings along with social and economic externalities.

However, the screening hypothesis of Kenneth Arrow and Michel Spence cautioned on the human capital related economic benefits of education (Arrow, 1972; Spence, 1973; Stiglitz, 1975). According to the screening hypothesis, in a job market with asymmetry of information about the competency and skill levels of the job aspirants, the social value of education is its role as a signalling device (through qualification/degree) for employers (Spence, 1973). The economic effect of productivity-enhancing and earning differential by level of education was not found to be significant. One of the factors that led to such observations could be that the candidates with higher qualifications (over qualified) engaged in job roles that in fact required far lower qualifications than that they have. Such a mismatch between outcomes of education systems (i.e. qualifications) and the labour market outcomes (i.e. job roles) was considered as wastage of educational resources. When a qualification does not ensure equivalent learning outcomes and competency on its own and is not matching with skill level of equivalent job

[1] See Thomson, Karl (2017). ***Durkheim's Perspective on Education***, 22 August, Accessed at https://revisesociology.com/2017/08/22/functionalist-durkheim-role-education/

[2] See at https://www.aacu.org/advocacy-liberal-education-0

roles, such mismatch prevails. The imperative is quality of education and learning outcomes of the education processes.

However, as mentioned above, longstanding debate and discussion is inconclusive on what should be the aim of education system, whether tailored accordingly to catering the needs of labour market requirements imparting technical skills or broad-based knowledge and generic skills. Counter-intuitive evidence of emerging research presents evidence-based contrarian arguments which are however still strong on education system imparting broad-based knowledge, critical thinking and generic transferable skills along with technical/professional skills (see Hart Research Associates, 2015, Hartley, 2017).

III Evolving Policy Framework for Vocational Education and Training in India

In the midst of all the debate and discussion, along with general education a stream of vocational education and training within the education system has been evolved as a parallel alternative, as a middle course, oriented towards immediate labour market requirements and career-orientation needs of individuals. Countries across the globe have evolved such system of a stream of vocational education and training for the purpose (see for instance, Hayward and Benson, 1993; Mehrotra, 2020; FICCI, 2011).

In India, the Gandhian thought of basic education[3] consisting of vocational education and training (i.e. craft-centred) to children as an important tenet, that evolved during late-1930s, has not been seen a light of the day in its implementation during colonial period. In the post-independence period, although vocational education has been a policy concern accordingly certain initiatives have in place, it has not been given attention that it required (MSDE, 2016; King, 2012; Tilak, 2002). Notwithstanding that to meet the skilled manpower requirements of the country certain beginnings for the technical education including engineering and poly-technique colleges, were laid during the Colonial rule and its base is expanded post-independence (Sen, 1989).

Perhaps one needs to distinguish between technical and vocational education and vocational training. Technical and/or professional education is largely associated with post-secondary level of education. In the Indian context, vocational education and vocational training are imparted at secondary and higher secondary level. While vocational education is part of and/or attached to school education system, vocational training is distinct stream and imparted through separate set of system. In this respect, the national policy formulation related to the sector of vocational education and training (VET) in India is mainly dealt by the two Ministries: Ministry of Education and Ministry of Labour. While the Ministry of Education cover polytechniques (through AICTE) and school levels vocational education institutes (NCERT) in the ***vocational education sector***, the Ministry of Labour (through DGT&E) regulates the ITIs/ITC of CTS and all the other Vocational Training Providers (VTPs) in ***vocational training sector*** of the country.

[3] The draft of **Basic Education** for the national education development was presented in the National Conference on Education that was held at Wardha during October 1937. Following that the Central Advisory Board on Education (CABE) Committee (Chaired by Shri B.G. Kher) on Wardha Education Scheme followed by Zakir Hussain Committee on Basic Education in 1938 recommended Gandhian thoughts of vocational education to implement in the Provincial governments.

The Directorate General of Employment and Training (DGE&T) under the Ministry of Labour manages the Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) for National Trade Certificate (NTC) holders along with Skill Development Initiatives Scheme (SDIS) based on modular employable skills (MES) and few others. The **Craftsman Training Scheme** (CTS) was initiated in 1950 by Government of India and established 50 Industrial Training Institutes (ITIs) across the country for imparting skills and training in various vocational trades. Along with ITIs in public sector, Industrial Training Centres (ITCs) under private sector have also been promoted. In order to maintain national standards of training and proficiency certification under the scheme, National Council for Vocational Training (NCVT) was established as an advisory body in 1956. All the ITIs and ITCs are affiliated to NCVT. Since 1956 and 1969 respectively the administrative and financial control of the CTS has been delegated to state governments. Also, Apprenticeship Act 1961 was enacted for regulation and control of training of the trade apprentices, it came into effect in 1963 and subsequently it was amended in 1973, 1986 and again recently in 2014.

Chart 1: Landscape of Education and Training System in India

<table>
<tr><th>Age</th><th>Grade</th><th colspan="2">Academic</th><th colspan="2">Technical / Professional</th><th>Vocational</th></tr>
<tr><td>24+</td><td>Res.</td><td colspan="2">General</td><td colspan="2">Technical / Professional</td><td rowspan="2"></td></tr>
<tr><td>22-23</td><td>PG</td><td colspan="2">General</td><td colspan="2">Technical / Professional</td></tr>
<tr><td>19-21</td><td>UG</td><td colspan="2">General</td><td colspan="2">Technical / Professional</td><td>Advanced Training Apprenticeship</td></tr>
<tr><td>17-18</td><td>11-12</td><td colspan="3">Higher Secondary- General</td><td>Polytechnique</td><td>ITIs / ITCCs</td></tr>
<tr><td>15-16</td><td>9-10</td><td colspan="4">Secondary - General</td><td>Secondary - Vocational</td></tr>
<tr><td>6-14</td><td>1-8</td><td colspan="5">Elementary Education</td></tr>
</table>

***Note**: UG –Undergraduation; PG – Post Graduation; Res. – Research including M.Phil and Ph.D.*

***Source**: Adapted from World Bank (2008).*

The Ministry of Education has under its control the technical and professional education including engineering and polytechnique colleges along with vocational education which is part of secondary and higher secondary levels of education. In terms of vocational education, multi-purpose schools were established following the suggestions of ***Secondary Education Commission of 1952-53*** which recommended the diversification of courses in school education. Along with vocational education, a work-experience programme was the recommendation of (Kothari) Education Commission of 1964-66. First National Education Policy (NEP) 1968 emphasized on the policy efforts to development of technical and vocational education in India.

Following the NCERT study in 1976, although a ***Vocational Education Programme*** (VEP) was initiated in 1976-77 in general education at higher secondary level (NCERT, 1976) and it was discarded subsequently in 1979. Again, following the National Education Policy 1986, a centrally sponsored scheme (CSS) of ***Vocationlisation of Secondary Education*** was initiated in 1988 and it was revised in 1992-93. Further, a completely revamped scheme was implemented in 2011. As envisaged in the NEP 1986, the **Pandit Sunderlal Sharma Central Institute of Vocational Education** (PSSCIVE) similar to that of NCERT was set up in 1993

as an apex research and development organization in the field of vocational education. Along with these initiatives while continuing with usual formal system of polytechnique education, the Ministry of Education launched a scheme of Community Politechniques in 1979 which was continued till the year 2007. After a couple of years of break, it was reintroduced as Scheme of Community Development through Polytechniques (CDTP) in 2009. It was to cater the skill development training needs of rural masses and urban slum dwellers. Such training is provided in Ministry of Education approved polytechniques. The recent third ***National Education Policy (NEP) 2020*** re-emphasised on vocational education at the school level and intends to initiate an action plan in this regard.

Box 1: Standardisation Initiatives

National Skill Qualification Framework (NSQF): It is quality assurance framework consists of 10 levels and each level is defined and described in terms of competency levels that would need to be acquired by an individual. The level descriptors of the framework indicate the process along with professional knowledge and skills in addition to the core skills and responsibilities a learner or an individual must possess.

National Occupational Standards (NOS): defines measurable performance outcome required from an individual engaged in a particular task. They are industry validated and prepared by SSCs.

Qualification Packs (QPs): They are industry-validated qualifications of an education and training programme, it is to be mapped into NSQF levels.

Sector Skill Councils (SSCs): Sector-specific councils setup by NSDC and led by industry. They are to prepare QPs and NOS of the sector while ascertaining job roles corresponding to each of the competency levels of NSQF. SSCs are to oversee assessment and certification in accordance with NOSs.

National Skill Development Corporation (NSDC): Setup in PPP mode to engage the private sector in the skill development sector.

National Skill Qualification Committee (NSQC): It was to oversee the implementation of NSQF and compliance of QP-NOS prepared by SSCs.

National Council for Vocational Education and Training (NCVET): Overarching national regulator for skill development, set up in 2018 subsuming both the NSDA and erstwhile NCVT.

Source: Govt of India.

Last one-and-half decade period, India has witnessed two major policies and important initiatives in the landscape of its skill development sector. The *National Skill Development Mission* was launched along with the ***National Policy on Skill Development*** (NPSD) 2009. For the implementation of policy and its Mission and monitoring the same, the setup of governance structure consists of the *Office of Advisor to Prime Minister on Skills* (OAPMS), *Prime Minister's National Council on Skill Development* (PMNCSD), *National Skill Development Coordination Board* (NSDCB) and ***National Skill Development Corporation*** (NSDC) which was established in 2008. Subsequently, while keeping NSDC to continue as it is, the other three set ups (OAPMS, PMNCSD and NSDCB) were subsumed into ***National Skill Development Agency*** (NSDA) in 2013. Further, while creating separate ***Ministry of Skill Development and Entrepreneurship*** (MoSDE) in 2014, the Government of India has launched ***Skill India Mission*** along with formulating the more comprehensive nature of ***National Policy for Skill Development and Entrepreneurship*** (NPSDE) 2015 which superseded the NPSD 2009.

Prior to the new policy regime since 2009, the vocational training provided by DGET through ITIs under CTS and other Modular Employable Scheme (MES) or Skill Development Initiatives Scheme (SDIS) was regulated by NCVT. However, envisaging the limitation of public sector and inadequacy of its infrastructure in scaling up of the skill development efforts in the country, the new policy regime has to rely on expansion of such infrastructure in the private sector along with their capacities hence its involvement of private extensively. NSDC in PPP mode in this respect is a catalytic organisational structure to expand the private sector involvement in vocational training. NSDA is to coordinate and harmonise the government and private sector which involves multiplicity of actors/players with varying vocational training programmes, standards, assessments and certification systems.

In this regard, as it is envisaged in the NPSD 2009 to meet the need for national qualification framework for standardising skill qualifications that are acceptable at the national level and internationally comparable, two Ministries of (Labour and Education) Government of India have involved in developing two separate frameworks: *National Vocational Qualification Framework* (NVQF) by ***Ministry of Labour*** and *National Vocational Educational Qualification Fram*ework (NVEQF) by ***Ministry of Education***. Subsequently both of these were subsumed to bring out a unified ***National Skill Qualification Framework*** (NSQF) in 2013 as a quality assurance framework for the country that is to be operationalized through National Skill Qualifications Committee (NSQC). The NSDA since its inception, in 2013, was mandated with ***anchoring and operationalizing*** the NSQF along with synergising the skill initiatives in the country. The NSQC is to approve the national occupational standards (NOSs) and qualification packs (QPs) prepared by the sector skill councils (SSCs). As envisaged in the NPSD 2009 and the recent NPSDE 2015, NSDC is to create and/or develop Sector Skill Councils (SSCs) that operate as autonomous body represented with industry, government, academia and civil society.

Table-1: NSQF Levels and their Certificate Equivalences

NSQP Level	NSQF Certificate	Equivalence		Validation/Certification Body
		Tech/Voc	General	
10	NCC8	Degree	Doctorate	University & SSC
9	NCC7	P.G. Diploma	Master's Degree	University & SSC
8	NCC6			University & SSC
7	NCC5	Advanced Diploma	Bachelor's Degree	Board of Technical Education/University & SSC
6	NCC4			
5	NCC3	Diploma		Board of Technical Education/School Board & SSC
4	NCC2		Grade XII	
3	NCC1		Grade XI	
2	NCWP2	Grade X	Grade X	School Board & SSC
1	NCWP1	Grade IX	Grade IX	School Board & SSC
RPL	RPL2	Grade VIII	Grade VIII	NIOS/State Open Schools & SSC
	RPL 1	Grade V	Grade V	NIOS/State Open Schools & SSC

***Note**: RPL – Recognition of Prior Learning; NCWP – National Certificate; NCC – National*

***Source**: Ministry of Education.*

NSDA was operating as an autonomous body under the Ministry of Skill Development and Entrepreneurship. Subsequently, however, the ***National Council for Vocational Education and Training*** (NCVET) was formed in 2018 subsuming NSDA and NCVT (with effect from 2020), as an *overarching regulator* of skill development sector in the country. At present

NCVET is anchoring and operationalizing the NSQF in consultation with the National Skill Qualifications Committee (NSQC). Further changes witnessed in this new policy regime are: the training and apprenticeship division i.e. Directorate General of Training (DGT) is shifted from Ministry of Labour to MoSDE in 2015. Polytechniques along with community development training polytechniques (CDTP) were transferred from Ministry of Education (Department of Higher Education) to MoSDE in 2017 and came under control of DGT since 2018. The new framework (NSQF) also recognises the prior learning and grants certification for the same based on an assessment.

Under this evolving new policy framework, NPSD 2009 aimed at skilling i.e. providing skill training to 500 million people by 2022 while sharing the target across 20 Ministries of Government of India. The recent policy (i.e. NPSDE 2015) aimed at skilling nearly 403 million people between 2015 and 2022. While the previous policy target period has 12 years duration (2010-2022), the recent policy has 7-years period (2015-2022) for its target achievement. It is explicit that recent policy regime is more ambitious than the previous one.

Technical education apart at post-secondary level, the *vocational education* at secondary and higher secondary level alongside the general course and/or as a separate stream, under these new policy regimes, is promoted. The *vocational training* is ranging from very short-term (a few weeks) to long-term (months) for the graduates of school and college education facilitating their transit to labour market while equipping with them the required skills that industry demands. It involved the multiple private and market players as: Providers, Assessors. Within the public sector there are number of Ministries and Departments involved with skill training. The Government of India is making concerted effort ensuring convergence across the state institutions and their programmes.

While the key state organ of Government of India concerned with vocational or skill training is MoSDE, the key stakeholder institutions of the Ministry at the national level are: DGT (Public), NSDC (PPP) and NCVET (Regulator). The latter's (NCVET) main function is recognition and regulation of awarding bodies, assessment agencies and skill related information providers, along with approval of qualifications, monitoring and supervision of recognized entities, and grievance redressal.

IV Conceptual Framework: Relational Mapping

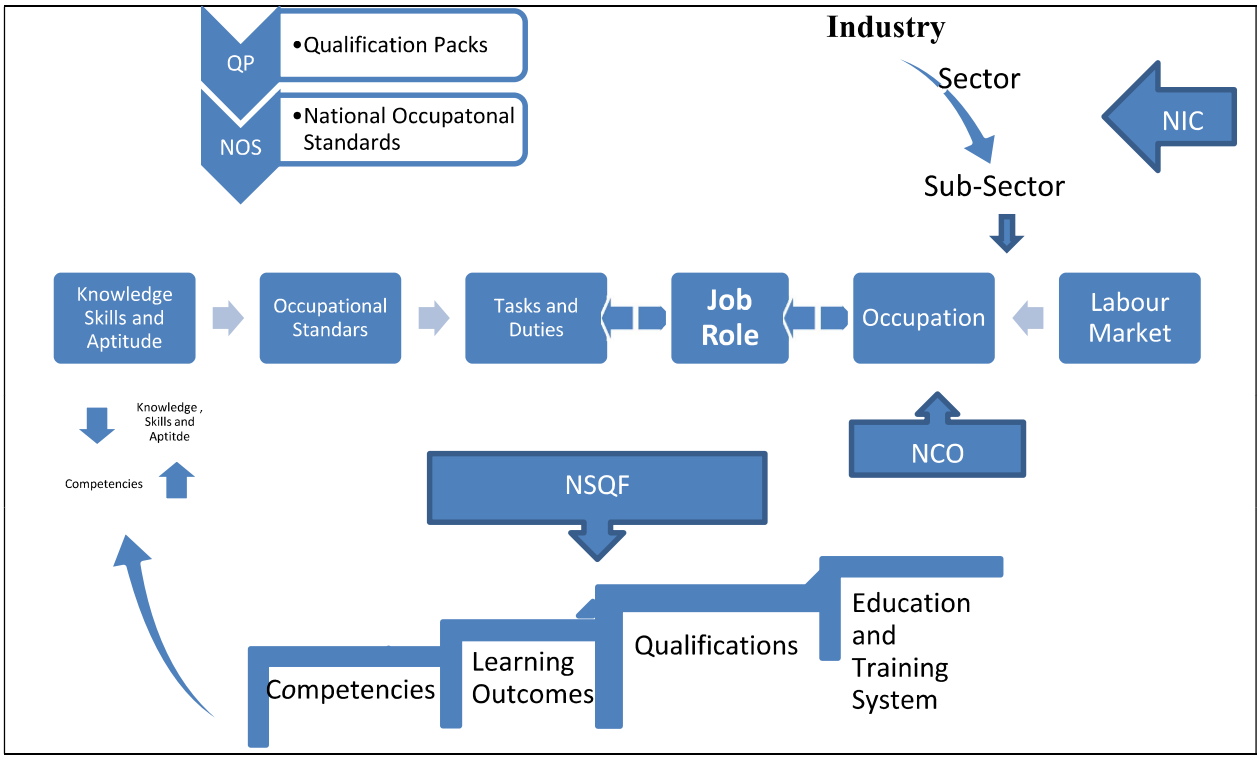
The following framework is developed to understand the skill development initiatives in India augmenting chances of success in labour market opportunities. In the economic perspective of demand and supply related to skilled workforce in the labour market, it is pertinent and imperative the out-turn graduates of the education and training system of the country matching with industry demand for such graduates with suitable skills for various job roles in different occupations. In the industry demand perspective, graduates' qualifications alone are not sufficient but their learning outcomes consisting of skills, knowledge and aptitude, and competencies matching with the occupational standards related to tasks and duties that associated with various job roles. While identifying and standardising the skills along with knowledge and aptitude that job roles across occupations in industry required, one can assess

the levels of such skills that a job aspirant graduate from an education and training system possessed or demonstrates.

In the perspectives of neoclassical economics of labour market, skills are embodied in individuals and forming the human capital (Rumberger, 1981). In the parlance of emerging ***skill development sector***, it is understood that **skill** is an ability of individual to perform or carry out a task or job productively with a desired level of *knowledge* and *competence* (see Bosworth and Warren, 1992; Green *et al.*, 1998; Shah and Burke, 2003a&b; GoI-NSQF, 2013; Mehrotra, 2014). While the *talent* is an inborn or innate ability of an individual, *skill* is an acquired ability through systematic learning with a concerted effort whether through formal education and/or training and it could be through informal ways, or through experience (GoI-NSQF, 2013).

Although '**skill**' is a common parlance in the *skill development sector*, it in fact is *invariably in combination* with two critical elements: **knowledge** and **aptitude**. Whereas the ***competency*** of an individual is resonance of *skills* blended with *knowledge* and *aptitude* possessed by the individual. Also, all they are essential constituents of learning outcomes of educational and training system. In other words, both the competency and learning outcomes constitutes three essential elements: knowledge, skills and aptitude.

Chart 2: Mapping



Note:

Source: *Authors' Mapping*

Learning outcome(s) is with respect to a reference or normative standard in acquiring relevant skills, knowledge and aptitude by level of education in the learning process. In other words it is about what a learner knows, understands and is able to do on completion of a learning process. ***Competency*** comes when an individual's ability to make use in the world of work

(application or in practice) these skills, knowledge and aptitude acquired through systematic learning in the education and/or training process. Further, in line with the above, skills, knowledge and aptitudes and the overarching competency and learning outcomes are in a way associated with ***qualifications*** when they are acquired through formal education and/or training system. A *qualification* is a formal certification of learning outcomes through an assessment and validation process invariably by a competent authority. *Qualification* is a testimony indicating acquisition of required basic skills at that level. When an individual with a qualification is ***competent*** to perform tasks and discharge duties in a qualification equivalent job role, it means that individual possessed and able to put in practice the acquired knowledge, skills and aptitude. Competencies among individuals possessing equivalent qualifications may, however, vary due to their innate abilities or their performance in acquiring the skill and knowledge, aptitude in the learning process.

Box 2: Concepts

Job role consists of set of tasks and duties to be performed by an individual

Occupation consists of set of jobs of similar nature

Knowledge is an outcome of assimilation of information through learning

Talent: It is an in born or natural ability or aptitude.

Skill is an ability of an individual to carry out a task/job. It is learned or acquired ability with effort through systematic learning process or by experience.

Aptitude: It is about capability, ability along with innate acquired capacity for something and talent.

Competence is a proven ability to use acquired knowledge, skills and personal and social abilities in discharging responsibilities

Learning Outcomes: It consists of knowledge, skills and competencies that acquired during the learning process. It is about what the learner knows, understands and what learner is able to be on completion of a learning process

Qualifications: Formal outcome of an assessment and validation process that determined by competent bodies

Source: NSQF

From the industry and labour market perspective, each *job role* that consists of *set of tasks and duties* is associated with *bundle of skills* deemed to carry out such tasks and discharge duties. In the common parlance, occupation consists of job roles of similar nature. But the occupational standard can be seen with respect to each of the tasks and duties in a job role that may require certain level of competence resonated with skills, knowledge and aptitude. It may be said that occupational standards are essential requirements according to the *skill content* of the task(s), job role or the occupation (Rumberger, 1981). It is in this way one can understand the common parlance of skill development sector.

Herein the '***employability***' of the graduates from the education and training system depends on their learning outcomes and competencies mediated through qualifications matching with the occupational standards (skill content) of job roles in the labour market. In other words, '*employability*' depends on the *skills possessed* by the individuals matching with the *skill content* of the job role.

Although in the common parlance of skill development sector very often *skill shortage* and *skill gap* are used and understood interchangeably, they are in fact distinct phenomenon of labour market (see Shah and Burke, 200a&b). ***Skill Shortage*** is with respect to availability of persons with deemed professional qualifications are short of demand/requirement in a particular profession/occupation or across different professions/occupations in a sector or industry. For example, the number of qualified medical professionals (doctors and nurses) available in India is short of demand or with reference to standard requirement for per lakh population as World Health Organisation (WHO) suggested.

In respect of ***Skill Gap***, although individuals possessing *qualifications equivalent to job roles*, their *competency levels* resonated with skills, knowledge and aptitude that they acquired ***mismatch*** with *desired/expected levels* or industry/occupational *standards of job roles*. If not based on qualifications as such, it can be seen as competency levels of job seekers for particular job roles are below the desired level of that job roles. Although the phenomenon of under-skilled labour or job-seekers is to a certain extent subjective with respect to the industry's expectations which vary across firms or organisations, it is however, definitely affected by quality of education and changes in production technology. Labour market adaptability to new skills is critical aspect in such skill gap which is due to changes in production technology.

Skills are, as very often classified, *generic* and *specific* in nature. In the skill hierarchy, generic skills, also sometimes referred to as meta-skills, occupies higher-order. Generic skills usually consist of literacy, numeracy, personal, communication, digital literacy, creativity, critical thinking, problem solving, perseverance, resilience and others skills. These generic skills are considered to be *transferable* and *portable* temporally, spatially and across occupations (Shah and Burke, 2003b). *Specific skills* are domain or field specific ones and are technical and/or vocational in nature. Portability and transferability of these skills is limited within the domain occupation, not across occupations; for instance, skills of accounting, medical professions, IT etc. There are certain generic skills within the domain that are transferrable / portable (across employers / organisations / firms) which can be referred to as *generic of the domain* distinguishing them from skill that are *generic in general*. Certain skills are of technology and/or organisation specific within the domain of occupation. In the rapidly changing technology of production and organisational changes, as shelf life of technology-specific skills may have short life span, skill obsolescence is very fast.

The entire education and training system cannot be and not necessarily, re-oriented or tailored accordingly as and when to follow the fast changing production technology or the organisational changes, especially that witnessed in the recent past. It can impart core generic skills which are transferable (spatially and temporally) and that can facilitate easy adaptability to changing skill demands/requirements of industry on the lines of production technology changes. In fact there is long standing debate on revamping the education system towards imparting the fast changing skill requirement of industry but even the large sections of industry body also considered education system imparting generic skills is critical rather than specific ones (for instance, Hart Research Associates, 2015; Hartley, 2017). The review of return to education research also indicated that the returns to general education are more prominent than that of vocational education (see Patrinos and Psacharopoulos, 2020). It is

observed from the industry body that ability to learn in completing a task is more portable than the acquired skill for a particular task (Bosworth *et al.*, 1992). The generic skill of learning how to learn and adaptability is critical to move along.

The solution to skill gaps due to emerging and rapidly changing technologies of production and organisational changes is *skilling*, *reskilling* and *upskilling* of human resources / workforce. Various stakeholders have been involved in this endeavour in the landscape of skill development sector: Governments, industry bodies and other private players. Initiatives this kind is a global phenomenon. The Government of India has also initiated certain policy and actionable measures accordingly to meet skill requirements of the industry and job opportunities for the working population especially the educated youth.

The Government of India initiatives of recent past have developed national skill qualification framework (NSQF) from the point of view of education and training system. Although NSQF is applicable to entire education system, it is very particular to technical and vocational education and training (TVET) systems in the country. NSQF consists of 10 levels according to levels of knowledge, skills and aptitude (learning outcome) that are acquired through any of formal, non-formal and/or informal learning process. Each level of the NSQF describes the process, levels of professional skill and knowledge.

In compliance with the NSQF, sector skill councils (SSCs) are to develop industry validated qualification packs (QP) consists of national occupational standards (NOSs) for various job roles in each of different occupations and sectors of the industry and economy. The National Skill Qualification Committee (NSQC) is to approve QPs and NOS complying with NSQF. It is to mapping QP-NOS into the learning outcomes of the education and training system of the country through NSQF to match the learning outcome with occupational standards of the labour market so that the mismatch between the supply and demand for the skilled labour can be minimised.

V Concerns of Education and Training System and Challenges of Skill Development

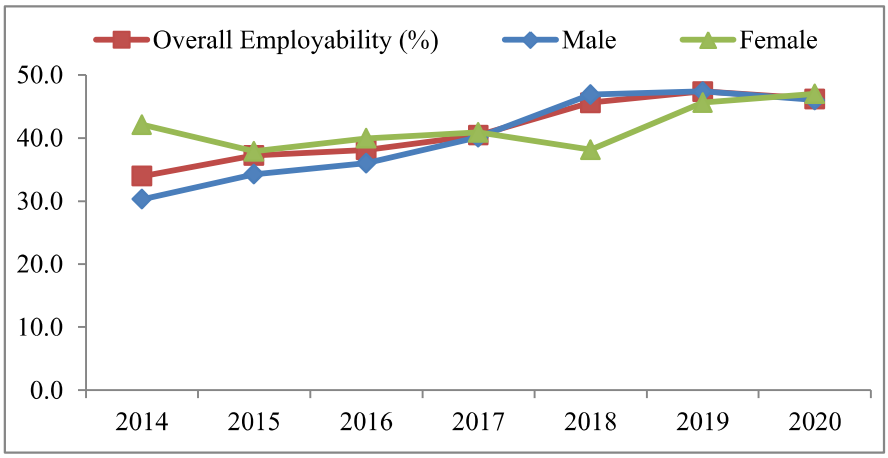
The education and training system of India is one of the largest in the world. There is a remarkable improvement in enrolment in school education as well as in higher and technical/professional education. The pertinent issue is the quality of education at all the levels of education and employability of graduates. Industry body assessment surveys have been indicating certain gaps (for instance, FICCI, 2011).

India Skill Reports[4] surveying fresh graduates have been indicating considerable level of ***skill gaps*** among educated youth in India (for instance, Skill India Report, 2020). Their annual series of reports for the last seven years show that although it is improving slowly during this period, still less than half of the fresh graduates from education institutions in India are

[4] Annual series of ***India Skill Reports*** since 2014 based on nation-wide survey is a joint initiative of *Wheebox*, *Global Talent Assessment Company* and *People Strong* in collaboration with *Confederation of Indian Industry* (CII) along with the other partners such as ***UNDP***, ***AICTE*** and *Association of Indian Universities* (AIU). Annual survey since 2014 covering more than lakh among fresh graduates, out-turned from education institutions, ready to join the workforce/labourforce are sample frame of the survey. See at https://wheebox.com/india-skills-report.htm

employable (Figure-1). It is indicating systemic structural issue of quality of education in India. The New Education Policy 2020 intends to address the issue of quality of education across levels of education (primary to higher, technical/professional and vocational) in the country.

Figure-1: Employability of Graduates in India



***Note**: Percentage among the Sampled fresh graduates of the respective year.*

***Source**: India Skill Reports.*

Along with skill gaps, certain sectors and profession in India have been witnessing ***skill shortage*** i.e. availability or supply is less than the requirement or demand. It is most prominent in the case of human resources for healthcare sector or medical profession in the country. The number of doctors and nurses available per lakh population in India are far short what required as per the reference norm set by the WHO (see Motkuri and Mishra 2020). Skill shortage is such that incidence of unqualified and/or less qualified working at different levels of medical profession in the healthcare sector (see Karan, 2020). The NSDC and KPMG Report of *Human Resource and Skill Requirement in Healthcare Sector*, has also indicated the same[5]. There are also few other sectors or professions in India which witnesses such skill shortage relevant to the sector/profession. In fact the KPMG reports for NSDC across various sector revealed the same[6].

TeamLease Services study has observed a mismatch between supply and demand for skilled labour as 90 per cent of employment opportunities (Job roles) require vocation skills which are lacking in job-aspirants (TeamLease, 2007). The study observed that the impact of skill deficit is higher than that of infrastructure gaps, as it exacerbates the inequalities. Further, McKinsey World Institute report had found that more 90 per cent of educated youth were not employable (Mckinsey, 2012). All these studies indicate the skill gap or deficit among the graduates from the education system of the country.

In respect of vocational training system in India, ***five major pillars*** of such training are: DGT (i.e. through ITIs), VTPs affiliated to NSDC (i.e. mostly private VTPs) and/or AICTE (i.e. Polytechniques), Secondary schools and other private organisations (British Council, 2016,

[5] NSDC-KPMG Report on *Human Resource and Skill Requirement in Healthcare Sector*. Accessed at: https://nsdcindia.org/industry-reports

[6] See Sectoral Reports at https://nsdcindia.org/industry-reports

MSDE, 2016). The growth of training institutions (ITIs) under DGT implementing the CTS appeared to be abnormally high and is questioned especially that the growth in the recent past. The Government of India's had set up 50 ITIs under its CTS as early as in 1950. The number of ITIs increased to 831 by 1980 and to 6906 by 2009 (Loksabha, 2018). However, as the DGT, MoSDE, Govt. of India, website at present indicates that the number of ITIs have increased to 15046, of which 12304 are private[7] ones. Such dramatically remarkable surge in ITIs during the last one decade period was questioned and investigated. The Parliament Standing Committee on Labour in its 33rd report of 16th Loksabha has made such (Loksabha, 2018). The Committee observed the number of ITIs were around 6624 in year 2012 when change in policy assigned the task to Quality Control of India (QCI), scrutinising and verifying ITIs and granting them accreditation. It was necessary step before the DGT approval and then forwarding it NCVT for the affiliation. The QCI during four years of its stint, it had accredited 6729 more ITIs, most of which were private ones. When it was questioned and complaints on the process were registered, it was investigated and found misconduct and violation of standard procedures. Quality of training in such Training institutions setup with questionable process with maintaining standards is a cause of concern.

Further, International Labour Organisation (ILO) assessment study found that employment orientation in vocational training system in India is lacking (ILO, 2003; World Bank, 2008). The demand for long-term training in basic trades programs of NCVT receding. While the public sector role in vocational training is diminishing and the role of Government ITIs in providing training for the unorganised economy is insufficient. Further, most important finding of the study was that low private returns to investment in vocational training. Regarding efficiency and accountability of ITIs it was very low; many of them operated at very low efficiency levels and accountability for the performance of it is was lacking[8].

The Government of India's Sharad Prasad Committee that was constituted in 2016 to review, rationalise and optimise the functioning of sector skill councils (SSCs) summited its report in the same year has critically examined and pointed out certain aspects of the policy in practice of vocational education and training in India (MSDE, 2016). The Committee observed that unlike many other countries, a sound vocational education and training (VET) system and national standards for the same is absent in India. It observed that shortage of qualified trainers along with inadequate training capacity and financing of VET leading to poor quality outcomes in the country.

The Committee again pointed out that there are too many SSCs and NOSs and their QPs. It is pointed out that when the total occupations according national or international classification of occupations (NCO) are not more than 450, how the national standards of occupations (NOSs) as prepared by sectors skills councils (SSCs) are around *ten thousands* (Mehrotra, 2020). Similarly when the economic activities are 21 according to national industrial classification (NIC), how the number of SSC are more than these economic activities. It also questioned the

[7] See DGT Website: https://dgt.gov.in/CTS

[8] Also the study observed that there is an imbalance in the supply of graduates and a lack of focus on skills training for the unorganised economy also there is insufficient academic freedom. Industry participation is absent and national vocational qualifications are narrow and inflexible (ILO, 2003; World Bank, 2008).

short-term training courses and recommended a training course duration minimum of one year including apprenticeship.

Further, the landscape of skill development sector in India has expanded widely during the last one-and-half decade. Various market players have come to involve in the sector as providers and/or assessment or certification bodies. Herein, along with skill training skill assessment is one of the critical dimensions of the emerging landscape of skill development sector in India. Given the scale and diversity of Indian education and training system in skill development, skill assessment is a big challenge (British Council, 2016). Along with training the assessor, quality and comparability of assessments needs to be ensured. In the new policy regime NSDC-funded private vocational training providers (VTPs) along with assessors or assessment bodies (ABs) are mushrooming in the landscape of Indian skill development sector. Herein the standardisation of quality training across these multiple players as providers and assessors and ensuring their compliance and accountability is a big challenge.

Effective assessment and credible certification was envisaged in the NSDP 2009 as its core principle. It envisaged developing quality assured learning, credible assessment and certification. The major national level certification bodies existed in India for long time, are: NCVT and AICTE. In the recent policy regime each of the SSCs under NSDC has also been functioning as sector-specific certification body. In 2016, a National Board of Skill Certification (NBSC) has been proposed for the purpose (British Council, 2016). Due to inadequate capacities of public national levels assessment bodies (ABs) such as NCVT and AICTE, multiple private assessment (TPA) agencies have emerged especially ever since the SDIS-MES was initiated in 2007.

Table 2: Major Vocational Training and Skill Development Schemes in India

Ministry	Wing	Scheme/Initiatives	Year
Ministry of Skill Development and Entrepreneurship	NSDC	Prime Minister Kaushal Vikas Yojana (PMKVY)	2015
		Prime Minister Kaushal Kendras (PMKK)	
		Technical Intern Training Program (TITP)	
		STAR (discontinued in 2015)	2013
	Directorate of JSS	Jana Shikshna Sansthans (JSS)	2009
	Directorate General of Training	Community Development Through Polytechniques (CDTS)	1999
		Polytechniques	
		Craftsman Training Scheme (CTS)	1950
		Crafts Instructor Training Scheme (CITS)	
		Apprenticeship Training Scheme (ATS)	
		Advanced Vocational Training Scheme (AVTS)	
		Skill Development Initiatives (SDI) Scheme (discontinued in 2017)	2007
		Dual System of Training (DST)	
		Flexi-MoU	
Ministry of Rural Development	Director of Rural Skills	Deen Dayal Upadhyay Grameen Kaushal Yojana (DDU-GKY)	
	Ajeevika - NRLM	Rural Self-Employment and Training Institutes (RSETIs)	
		Ajeevika Skill Development Programme (ASDP)	2011
Ministry of Housing and Urban Poverty Alleviation (MHUPA)	NULM	Employment Skill Training and Placement (ESTP) Programe	
Ministry of Labour	Directorate General of Employment	National Career Service (NCS)	

Note:

Source: *Authors' Compilation.*

Ministry of Labour with its arm, DGET, was responsible for the VET in the country till DGT was subsequently transferred to MoSDE in 2015. Now along with the core MoSDE, there are more than 20 Ministries at the national level that conduct vocational training programmes. Besides the SDI-MES (which was discontinued in 2017) of DGT, the National Skill Certification and Monetary Reward Scheme (NSCMRS) known as Standard Training Assessment Reward (STAR) scheme was initiated in 2013 (discontinued in 2015) was the other major short-term vocational training programme or scheme that existed in India. Subsequently while closing the STAR, the Prime Ministry Kaushal Vikas Yojana (PMKVY) was initiated in 2015. As it was the case of STAR programme, NSDC is implementing the PMKVY (1.0, 2.0 and now 3.0).

While the assessment and certification of long-term training courses under CTS was conducted by DGT and NCVT, for the quality assurance of short-term training courses under SDI-MES consists of independent assessment, but certification by NCVT. Although DGT was responsible for SDI-MES, various registered Vocational Training Providers (VTPs) conduct the actual training while the assessment[9] is done through a panel of Assessing Bodies (ABs). Further, for the short-term training courses under the STAR and subsequent PMKVY schemes they have independent assessment and certification by SSCs, not the NCVT. It is required to cater assessment needs of multiple short-term courses of vocational training initiated thereafter in the skill development sector of the country. The assessment of training under these schemes providing short-term training engaged number of third party assessment (TPA) agencies empaneled by SSCs of NSDC (British Council and ILO, 2015).

In all, the convergence of training programmes across various Ministries of the Government India along with synergy needed due to complexity and duplication of courses in these training programmes is a major challenge in the skill development sector of India. Further, the sector needed standardisation of quality assurance in training, assessment and certification across various multiple (private) agencies involved in the process.

VI Concluding Remarks

The present paper examined the policy framework of vocational education and training in India along with its recent policy on skill development and initiatives. It developed a conceptual framework in understanding the skill development sector, recent policy and its standardisation framework, for relational mapping of the educational outcomes and occupation-skill standard of industry. Subsequent cursory review has examined certain issues and challenges in the national system of vocational education and training that including the recent skill development initiatives. It is noted that the country is experiencing skill shortage in certain in certain sectors or industry. Skill gaps of graduates in the country appear to be pertinent and hence their employability levels are less than desired levels required for the industry. Further, it observed that in the context of skill development initiatives that allowed multiple players with high dependence on private sector in implementing these initiatives

[9] It is assessment of trainees that is to assess the skill gained by them in the programme.

mushrooming of private training providers and assessors, the standardising the quality of training has become a serious cause of concern.

* * *

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