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National Policy on Skill Development and Entrepreneurship 2015: An Ontological Analysis

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Abstract

India has formulated a National Policy for Skill Development and Entrepreneurship in 2015. (Ministry of Skill Development and Entrepreneurship, 2015) Despite voluminous research on the subject, the approach to skill development and entrepreneurship is fragmented. There is no unified framework to address the problem systematically and systemically. The paper presents an exhaustive and systematic analysis of the National Policy on Skill Development and Entrepreneurship 2015. The paper highlights the dominant and neglected areas in the policy. The framework and the results can be used to develop a roadmap for policy, practice, and research on the topic.

Keywords: Skill Development, Entrepreneurship, Ontology, National Policy

Introduction

Today, organizations and their working are being transformed with the advent of technology and the effects of globalization. In this scenario, with increased job openings, there is an expectation from the labor force to stay updated with the changing needs of competitive economic market. India, the second most populous country, needs to be vigilant about its population's skill development and entrepreneurship.

India with its aim to outshine the developed countries has to move away from the conventional mode of education and prioritize skill development to equip its population. There is an imperative need for the country to set an agenda for skill development as the country is demographically one of the youngest nations in the world with more than 62% of its population in the working age group (15-59 years), and more than 54% of its total population below 25 years of age. Its population pyramid is expected to bulge across the 15-59 age groups over the next decade. It is further estimated that the average age of the population in India by 2020 will be 29 years as against 40 years in USA, 46 years in Europe and 47 years in Japan. (Ministry of Human Resource Development, 2013) This poses a challenge for the country's economy, as at one end it is striving to become a global knowledge economy and at the other end it has an accumulation of a large number of unskilled people. India also faces a hurdle where its conventionally educated youth have no space to be accommodated in the job market. Facing this dual challenge, India needs to be

vigilant to turn its bulging population into an asset while carving its niche globally, before it turns out to be a liability for the nation.

Understanding the crisis of the hour, at one end there is the need to skill the youth and make them capable enough to sustain themselves in the ever-changing economy, whereas at other end the efforts have to be made in enabling an ecosystem to provide jobs and workspace to the skilled workforce. Here, the focus is not just to expand the skill training programmes but also to raise the quality within the workforce.

The government understood the urgency of the issue and formulated a Policy for Skill development and Entrepreneurship in 2009. It called out for a review every five years to adapt to the changing national and international scenario. The policy framework of 2009 was followed by National Policy on Skill Development and Entrepreneurship 2015. The primary objective of the 2015 policy is to meet the challenge of skilling at scale with speed, standard (quality) and sustainability. It aims to provide an umbrella framework to all skilling activities being carried out within the country, to align them to common standards, and to link skilling with demand centers. In addition to laying down the objectives and expected outcomes, the policy also identifies the overall institutional framework which will act as a vehicle to reach the expected outcomes.

Skills development is the shared responsibility of the key stakeholders viz. the government, the entire spectrum of corporate sector, community based organizations, those outstanding, highly qualified, and dedicated individuals who have been working in the skilling and entrepreneurship space for many years, industry and trade organizations. The policy links skills development to improved employability and productivity in paving the way forward for inclusive growth in the country. The skill strategy is complemented by specific efforts to promote entrepreneurship in order to create ample opportunities for the skilled workforce. (Ministry of Skill Development and Entrepreneurship, 2015)

Understanding the magnitude of the problem, the policy looks out to be a comprehensive document in laying out each detail of the skill development and entrepreneurship landscape in the country. In our paper, we look out to understand the dynamics of the policy in dealing with issue of skill development and entrepreneurship. Our analysis of the policy document by mapping it onto an ontological framework will throw light on its focused and neglected domains.

It is imperative that the policymakers have a clear picture of every aspect of the domain.

Without a clear picture, one risks replaying the proverbial story of the five blind men each of whom imagined an elephant differently after touching its different parts. A sighted wise man helps them map these "parts" and visualize the whole elephant. Similarly, without a clear visualization of skill development and entrepreneurship domain, the policy makers may continue to fumble in the dark and leave the whole less than the sum of the parts. (Ramaprasad & Syn, 2015)

This paper presents: (a) an ontological framework for skill development and entrepreneurship; (b) the results of mapping the key document on the topic onto the framework, and (c) the implications of the relative emphases on various elements highlighted by the mapping.

Literature Review

The government has taken a proactive step by introducing the National Skill Development and Entrepreneurship Policy 2015 at the juncture where the country aspires and sets its journey to embark on a transition into knowledge based economy. But as we base our hopes on the policy, it is critical to formulate our understanding about the domain within the existing literature. The policy formulated action plan for two domains - skill development and entrepreneurship. Though these two domains are interrelated and bear significantly on each other, their individual nuances cannot be ignored. It would be appropriate to term them as two sides of the same coin which need individual attention.

The 12^{th} Five Year Plan lays importance on building skills as an instrument for enhancing labour productivity and effectiveness to the overall production. It is as an imperative tool to push the growth of the economy and boost the production .It is not only a significant tool for enhancing the production possibility outward but also an instrument to empower the individual and improve his/her social acceptance or value.

Over the past few years, the government of India has successfully identified Skill Development as one of its key agenda. Through creation of frameworks, nodal bodies and public private partnerships focusing on skill development domain, the Government of India has not only attracted domestic but also many foreign players in the skill development and training domain (UKIERI, 2015)

The skill development ecosystem in India is complex, large and diverse, providing varied levels of skills across an extremely heterogeneous population. Along with that skill is imparted in India through formal and informal mechanisms. Public and private sector are

employed for disseminating vocational training in the country. (Konrad Adenauer Stiftung , 2015)

The hurdles in the domain have been captured as follows: “The skills challenge becomes acute for India considering that the country has a large portion of its population below 25 years of age. Currently a major proportion of this population is not productively engaged in economic activities due to a ‘skills v/s jobs requirement’ mismatch. The skills v/s jobs mismatch often leads to economically inactive working age group people. This not only impacts the economy, it also has serious consequences for the society at large. Social unrest such as insurgency, red belt has been witnessed in several areas of India should be heeded with a measure of urgency” (FICCI, nd). The FICCI report mentions that these challenges of skill development needs to be addressed for reaping the benefits of demographic dividend by developing skill initiatives which focus on quantity, quality and access.

“The National Skill Development Council (NSDC) shouldered the responsibility of setting up sector skill councils to define the standards of their sectors after The National Policy on Skill Development, 2009. Various other measure like the National Vocational Education Qualification Framework (NVEQF) which allow seamless migration from vocational to formal education and The All India Council for Technical Education (AICTE) under the NVEQF are existent in the field. There are initiatives to align these frameworks to synergize the momentum. ‘This framework for skill development, however, is not robust and has several limitations, which may be broadly categorised as: (a) Institutional/scalability, (b) Financial, (c) Perception, (d) Industry/Employer apathy, and (e) Quality issues.” (Dilip, nd)

The literature on skill development in India has presented the emergent need to develop skills of the workforce for the country to strive in the coming years. One of the methods suggested is to “Adopt a coherent and strategic approach to the design and implementation of skills policies to achieve greater access to quality education and training, and better learning outcomes. Work with the private sector to develop education systems responsive to the needs of productivity driven economies, including through vocational training and life-long learning, to achieve a better match between the skills demanded and those supplied” (OECD, 2014)

Others have suggested two main strategies to combat skill gap which are – Active Labour Market programmes (ALMPs) and Technical and Vocational Training Educational (TVET). ALMP is an umbrella term that is used to define all social expenditure (excluding education)

which aims to find employment or increase the net income of the beneficiary (Krishnakumar, 2015).Four main types of Active Labour Market Programmes are Training and Development, Entrepreneurship, Employment services and Employment subsidies (Kluve, 2016).

Whereas TVET programs (or just TVETs) are defined by UNESCO as a collective term for aspects of the educational process (other than general education) which contribute to the study of sciences, technologies and the acquisition of practical skills, aptitudes, understanding and knowledge relating to different sectors in employment (Tripney, 2013). There are four types of TVET – Technical Education, Vocational Training, Vocational Education, and Apprenticeship. While looking at the condition of India in terms of TVET programmes is that the system is inadequate and inefficient before it can be expanded and reformed (Krishnakumar, 2015).

The paper on Skill Development in India by Vaibhav Krishnakumar talks about the AVLM strategy for tackling Skill gap. It presents the linkage between Skill development and entrepreneurship as entrepreneurship is one of an AVLM strategy to fight skill gap. He talks about that entrepreneurship can surpass the battle which the developing countries undergo to provide formal employment. Since the employment is limited, this provides a common alternative.

The report by National Knowledge Commission demonstrates that India enjoys an enormous potential for the creation of wealth through knowledge which can be enabled through Entrepreneurship and Innovation. This can be utilised for generation of wealth if they are supported principally by the availability of skilled human resources, access to finance and the ability of the State to create an enabling environment. We can easily infer the interconnection of Skill development with entrepreneurship with the definition of entrepreneurship adopted by the report. ‘Entrepreneurship is the professional application of knowledge, skills and competencies and/or of monetizing a new idea, by an individual or a set of people by launching an enterprise de novo or diversifying from an existing one (distinct from seeking self-employment as in a profession or trade), thus to pursue growth while generating wealth, employment and social good’ (National Knowledge Commission, 2008).The report suggested to incorporate synergy between Education (including modern vocational education training/skill development), Innovation (converting ideas into wealth and employment) and Entrepreneurship.

The literature encapsulates the need and necessity to unravel these complex domains of skilling and entrepreneurship to complete the cycle of development. Though looking at the literature we can also visualize the vastness of these sectors individually. Therefore, an ontological framework will be used to capture this vast and complex domain of skill development and entrepreneurship as explained in the following section.

Ontological Framework

There are various factors which affect the domain of skill development and entrepreneurship. The linear natural English narrative would be insufficient to effectively capture the complexity of skill development and entrepreneurship. This narrative would not only be voluminous but also increase the possibility of selectivity in research and application. Whereas, structured natural English representation ontology would not only be parsimonious but would also reflect the complexity of skill development and entrepreneurship by making it visible and comprehensible. The ontological framework brings all the building blocks together and presents the domain in a complete and parsimonious way.

The ontological framework is a novel method of analyzing and contemplating the domain knowledge as proposed by Ramaprasad and Syn (2015). The ontology can be used to deconstruct an ill-structured problem, elucidate its components, and enable a roadmap for its resolution. An ontology represents the conceptualization of a domain (Gruber 2008); it organizes the terminologies and taxonomies of the domain. It is an "explicit specification of a conceptualization," (Gruber 1995, p. 908) and can be used to systematize the description of a complex system (Cimino 2006). "Our acceptance of an ontology is… similar in principle to our acceptance of a scientific theory, say a system of physics; we adopt, at least insofar as we are reasonable, the simplest conceptual scheme into which the disordered fragments of raw experience can be fitted and arranged." (Quine 1961, p. 16) The ontology is simple yet it captures a holistic view of the combinatorial complexity of the problem. While the ontology gives a closed description of the domain, it is also flexible enough to accommodate the changes in the domain. The ontological analysis is an important way to synthesis the cumulative research. The complex and hybrid domain of skill development and entrepreneurship is deconstructed using an ontological framework.

This complex and hybrid domain can be described systematically as:
Skill Development and Entrepreneurship = f (Agents of Skill Development and

Entrepreneurship + Effect of Policies + Policy Instruments + Beneficiaries + Outcomes of the Policy).

The ontological framework is constructed by a logical process by developing the taxonomies and terminologies from the literature on the domain. The glossary explains the dimensions and category of the ontology to avoid any ambiguity. The extraction of the core logic and its presentation as an ontology is based on Ramaprasad and Mitroff's framework (Ramaprasad & Mitroff 1984) for formulating ill-structured problems. The ontology for skill development and entrepreneurship is represented using Excel. The five dimensions of skill development and entrepreneurship are expressed in the columns as shown in Figure 1. The dimensions would be discussed from left to right as (a) Agents of Skill development and Entrepreneurship (b) effects on Skill development and Entrepreneurship (c) policy on Skill development and Entrepreneurship (d) Beneficiaries of Skill Development and Entrepreneurship (e) Outcome of Skill Development and Entrepreneurship.

Agents	['s]	**Effect**	[+]	**Policy**	[policy for]	**Benficiary**	[+]	**Outcome**	[development]
Government		Generative		Legislative		Youth		Skill	
Central		Catalytic		Regulatory		Adult		Needed	
State		Restrictive		Economic		Men		Competent	
Local		Prohibitive		Fiscal		Women		Certified	
Individuals				Contractual		Community		Employable	
Investors				Information		Marginal		Entrepreneurship	
Incubators				Education		Special		Mindset	
Industry				Technology				Culture	
Private				De Facto/De Jure				Support	
Public				Social				Infrastructure	
Public Private Partnership				Cultural				Innovation	
MSME				Ethical				Performance	
Academia									
High School									
Polytechnic									
Training Institute									
University									
NGO									
Civil Society									
CSR Entity									
External Partners									
Global Financial Institutions									

Figure 1: Ontological Framework for Skill Development and Entrepreneurship

The domain of skill development and entrepreneurship is working with various agents who are either initiating or impacting the process. Therefore:

Agents ⊂ (Government (Central, State, Local), Individuals, Investors, Incubators, Industry (Private, Public, Public–Private Partnership), MSME, Academia (High School, Polytechnic,

Training Institute, University) NGO (Civil Society, CSR entity), External Partners, Global Financial Institutions)

The provisions of the policy/legislation lead to creation of various effects. Thus:
Effect ⊂ (Generative, Catalytic, Restrictive, Prohibitive)

There are various instruments that can be employed to have an effect in the development of skill development and entrepreneurship based on the literature in public policy (Lascoumes and Gales 2007;1-21):
Policy ⊂ (Legislative, Regulatory, Economic, Fiscal, Contractual, Information, Education, Technology, Innovation, De Facto/De Jure (Social, Cultural, Ethical)).
The legislation/policy are created to impact groups in the highest possible way. Therefore:
Beneficiaries ⊂ (Youth, Adult (Men, Women), Community (Marginal, Special))

The policy for skill development and entrepreneurship would enable development of outcomes for beneficiaries. Thus:
Outcome ⊂ (Skill (Needed, Competent, Certified, Employable), Entrepreneurship (
Mindset, Culture, Support, Infrastructure, Innovation, Performance)

Components of Skill Development and Entrepreneurship

The ontological framework has been logically constructed through an iterative process. The dimensions are arranged from left to right such that the concatenation of an element from each dimension with the adjacent phrases/words results in formulation of a natural English sentence representing possible components of skill development and entrepreneurship. The basis of the argument is that there is a system instantiated by the agents creating an effect with the policy for the beneficiaries to have the desired outcome of skill development and entrepreneurship.

The ontology encapsulates 18*4*11*5*10 = 39,600 possible components of skill development and entrepreneurship. This is a detailed and aggregate representation of the first level analysis of the taxonomies. One can delve deeper into the components to produce more detailed and voluminous results. The ontological framework gives us the ‘big picture’ of the domain and helps us visualize its combinatorial complexity. Examples of three illustrative components are listed below. They are:

1. Government-Central's generative legislative policy for individual-youth skill-needed development.
2. Academia-High School's catalytic education policy for individual-adult-women entrepreneurship-mindset development.
3. NGO-Trade Organization's restrictive contractual policy for community-special skill-employable development.

We may not find the usage of the same sentences in the documents but it is possible to discover/infer analogs of the same from the documents. The components can be instantiated in a variety of ways. Some components may be instantiated verify frequently, while others are infrequently, or not at all. The frequently instantiated components are referred to as 'bright' spots while less frequently ones would be called 'light' spots and ones which are not at all instantiated would be called 'blind/blank' spots. While we term these components 'bright', 'light', and 'blind/blank' spots, we need to remember that the dominance or negligence of a component does not signify the criticality of that component to the domain. A theme may be dominant possibly due to herd effect or as a product of convenience, whereas the less dominant ones may be the outcome of inexperience or oversight. While a 'blank' spot may be due to its infeasibility. The ontological framework was employed to visualize the 'bright', 'light' and 'blind/blank' spots in the National Skill development and Entrepreneurship Policy 2015.

Method

The National Policy of Skill Development and Entrepreneurship 2015 was mapped onto the ontological framework manually. The individual sections of the policy constitute the unit of analysis. While mapping the policy the sections of both skill development and entrepreneurship were identified and mapped in context of their significance. Thus, the two-step selection assured that the coding was comprehensive with reference to the policy framework. A total of 120 sections were coded.

The documents were mapped onto the ontological in MS Excel using a binary scale (present, absent). The coders reviewed the section to determine whether an element of the ontological is present or absent in the section. The glossary was used to assure the validity of coding. Each item was coded by two coders jointly. The data were analyzed using the same MS Excel tool used for coding to generate ontological map for the skill development and

entrepreneurship. The map shows the frequency of occurrence of each element (monad) of the ontological framework in the policy. This map is presented and discussed in the section below.

Results

The results of the mapping are summarized in Figure 2. The numbers in parentheses adjacent to each element indicate its frequency of occurrence in the policy document; the bar below is a visual representation of the same scaled to the maximum frequency in the map.

The policy focuses on a wide range of Agents with different emphases. Among the Government agents, the dominant focus is on the Central (115) government; there is very little emphasis on the and State (11) and Local (1) governments. There is less but almost equal focus on Industry-Private (24) and Industry-Public (21) partnerships, and slightly more on Public-Private Partnerships (28). Among agents of Academia, the dominant focus is on Training Institutes (20) and Universities (20) followed by High Schools (10), Polytechnics (10). External partners (9), Investors (7), Incubators (7), MSME (7) are only lightly emphasized while Global Financial Institutions are absent in the policy.

The Effects sought through the policy are exclusively Catalytic (80) and Generative (58); while Restrictive (1) and Prohibitive (0) policies are not discussed.

The dominant Policy instruments in descending order are Educational (55), Informational (51), Technological (37), Contractual (32), and Economic (22); De Facto/De Jure (Social (6), Cultural (3), and Ethical (1) policies are emphasized very little. There is no mention of Legislative (0) policies.

Among the Beneficiaries the dominant focus is on the Individual and less dominant focus is on the Community. Among the Individuals the dominant focus is on the Youth (85) followed by Adult Women (63), and Men (54). Among the Communities, the dominant focus is on Marginal (23) communities and is slightly less on Special (17) communities.

The focus on Skill is slightly more than on Entrepreneurship in the Outcomes. Within Skills there is almost equal focus on Employability (46) and Competence (46), Quality (44), Certification (37), and Need (36). Within Entrepreneurship the focus in descending order is on Support (25), Culture (24), Infrastructure (16), Innovation (11) and Mindset (8). Performance (2) is the least focused outcome.

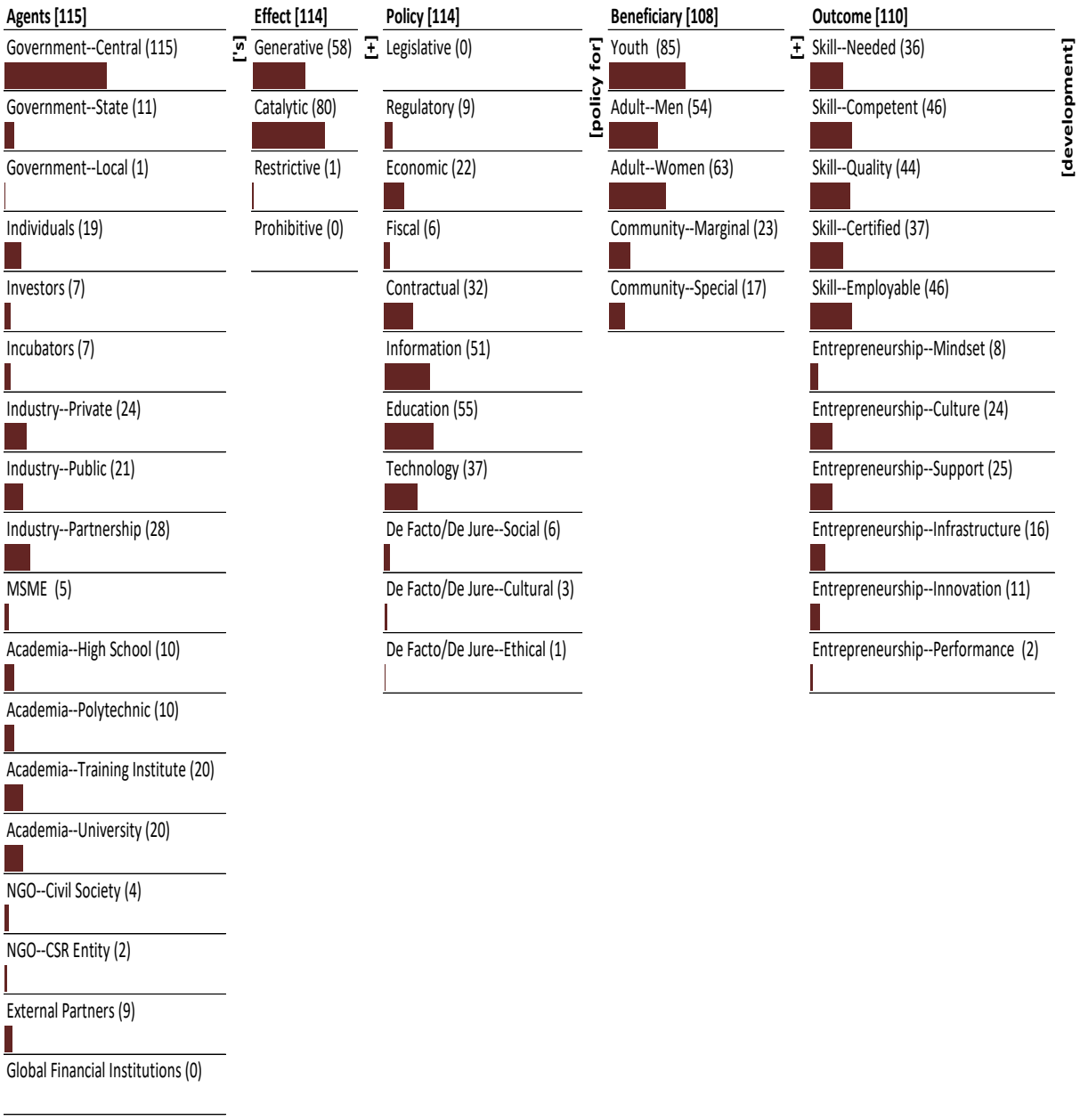

Figure 2 Mapping of Skill Development and Entrepreneurship Policy 2015

Observations and Implications

The policy seeks to create unbridled skill development and entrepreneurship through generative and catalytic policies, with no restrictions and prohibitions. The policy is to be implemented through the agency of the government, industry, and academia – with the government having a dominant role. NGOs and other external partners have very little role. A variety of policy instruments will be employed – dominantly educational, informational, technological, economic, and fiscal. The policies are targeted primarily at individuals – both youth and adults. However, attention is given to communities too. While skill development is emphasized more, entrepreneurship is given significant attention.

The policy is asymmetric – focusing only on the generative and catalytic and not on the restrictive and prohibitive effects. The latter two will be necessary to manage the trajectory of the outcome. The first two create a positive feedback loop which will amplify deviations from the norm; the latter two will create a negative feedback loops which will attenuate deviations from the norm. The two must be balanced to effectively manage the trajectory of skill development and entrepreneurship.

The policy is imbalanced in capturing the role of Agents. While the major focus is on government, industry – academia role has also received attention. The global financial bodies are away from the ambit of the policy. Central government receives dominance in the policy due to the fact that firstly it is a central policy where the Central government would hold utmost power. The policy recognizes the need of collaboration with industries for skill development and entrepreneurship and thus has spaced importance across all types of industries – public and private .The next dominant agent after central government has been Public private partnerships. Where the policy has thrown light on importance of academia support too, it has neglected the role of global financial institutions in skill development and entrepreneurship in India.

The policy has brought the focus on two dominant categories - education and information. This is primarily because the policy focuses on building the gaps in the domains through educating the beneficiaries and bridging the information asymmetry. The results reveal that the policy has not looked upon legislative and ethical policies for skill development and entrepreneurship.

The policy has employed various instruments to carve a change in the skill development and entrepreneurship sector through information, education, technology and contracts. But we infer that there are certain gray areas in the attention shed by the policy on the instruments. Like ,at one end the policy is trying to create awareness and disseminate information about the importance of skill development and entrepreneurship but on other end it has not considered the need of using de facto/de jure social and cultural policies to infuse behavioral change in the beneficiaries.

The policy has valued the inclusivity element as significant attention is spaced across all beneficiaries. The inclusivity is not only looked from the perspective of socio-economic groups but also through the lens of geographical inclusivity. The only area where the policy raises some brows are over the fact that while it aspires to build on the inclusivity , it has kept

social , cultural and ethical instruments out of its vision ,which play a critical role to understand the responsiveness of the 'new' mindset among the beneficiaries.

The results reveal that more stress is given on establishing skill oriented outcomes than the entrepreneurship outcomes. The dominant outcomes of the policy are on building competent skills and increasing employability through skilling. The other skilling outcomes have also received significant attention in the policy. While the entrepreneurship outcomes receive minuscule attention as compared to skill outcomes, entrepreneurship- performance outcomes remains the least focused amongst all outcomes. While the policy creates measures and mechanism for skill development –entrepreneurship and building synergy between players, it is not closing the loop by paying significant attention in achieving the performance outcome of entrepreneurship.

Overall, the coverage of the policy is broad and comprehensive. The policy has been extensive and has embraced different values like aspiration, advocacy, capacity, mobilization, engagement, ICT enablement, outreach, synergy and partnerships. Various initiatives and schemes are being built with the onset of National Policy on Skill development and Entrepreneurship 2015. Ongoing assessment of the outcomes on different phases of implementation using the ontological framework can help make course corrections.

Conclusion

The ontological framework of skill development and entrepreneurship illustrates the 'big picture' of the domain. It helps visualize the combinatorial complexity of the domain. The ontological framework can be used as a common, comprehensive framework to map the anatomy of skill development and entrepreneurship, and the research, policies, and practices on the topic. It can also be used to compare and contrast different countries' or states' policies and practices.

The paper's core contributions are:

1. A systemic and systematic framework for conceptualizing the domain of skill development and entrepreneurship;
2. A method of mapping the policies (and potentially practices and research) on the topic; and
3. Insights about the gaps in the polices (practices and research) and a roadmap for future to advance the domain.

While interest in the domain of megaprojects is expanding rapidly there has not emerged a comprehensive framework. The ontological framework proposed in this paper is probably the first to try to comprehensively encapsulate the combinatorial complexity of the domain. As demonstrated in the paper it is a lens to meta-analyze and synthesize the policy in the domain.

The method of coding and analyzing the policies in the domain presented in the paper provides a comprehensive picture of the policies. The results highlight significant gaps in the policy analyzed. All the components encapsulated in the ontological framework may not be equally important. Yet, there are significant components that appear to have been overlooked. The policy makers of the domain can use the ontological framework to direct policies to important but overlooked components and away from less important but overworked components.

The framework can be used for both research and practice. Just as we have mapped the state of national policy on skill development., it can be used to map the state of research on skill development and associated practices (and associated policies and guidelines) to highlight the state-of-the-practice. The latter can highlight potential interesting or overlooked areas of practice. The two maps will also highlight the gaps between the state-of-the-research, policy and -of-the-practice. Bridging this latter gap can help improve the rigor and relevance of megaprojects research, and the application of research to practice and vice versa.

The landscape of a domain can change over time with emerging policies, practices, and research. The ontological framework-based roadmap can be amended to reflect the changing landscape. New categories and dimensions can be added, obsolete ones discarded, and existing ones modified. Changes can also be introduced by the shifting focus in the domain. The finer levels of dimensions and elements can be added to the ontological framework to reflect the greater focus on certain dimensions or categories. For example, new stakeholders can be included to reflect their growing importance. On the other hand, sub-categories and sub-dimensions can be collapsed to echo their diminishing importance in the domain. The shifting focus and direction of research and development can be chronicled by analyzing the snapshots of ontological maps over time. The ontological framework can help visualize the past and present of the domain, and envisage its future.

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