



<u>Collaborative Research Plan between CoE-CPEC, PIDE &</u> <u>Jiangsu University</u>

Research Topic

Designing and Realization of Skill Development for CPEC viz-a-viz Chinese Experience

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Executive Summary

China after attaining its independence from the foreign occupation and declaring itself as a socialist country in 1949, it struggled and suffered from various social and economic complications. However, during 1970s major reforms were introduced which helped the economy to regain its strength and rise in the international market. The complications which China faced in terms of its human resource development are the learning steps for Pakistan. To analyse and replicate these policies in the HRD of Pakistan a one-year joint project has been commenced between Centre of Excellence for CPEC and Jiangsu University China. To achieve appropriate results the work plan has been designed in which a focal person of CoE-CPEC shall visit Jiangsu University China to carry out the first phase of research study (up to four months), in the second phase the focal person of Jiangsu University China will visit Pakistan (up to four months), and in the last phase of the study joint events will be organized in both countries to disseminate the outcomes and findings. All the related cost will be borne by the host institutions during the visits.









1 Introduction and Background

Historically, China was a feudal society and a semi colonial and socialist country during the mid-19th century. The agrarian economy severely suffered from war, famine, and was considered as a struggling economy (Yang & Zhang, 2003), adversely effecting its political structure, hence, making it a low-skilled labour market. China has declared itself to be a socialist country in 1949 to regain its independence from foreign occupation. The Chinese Communist Party (CCP) took over the state and adopted a centralized, socialist political model. As a result, China became a socialist country with a highly centralized economy (Ogden, 1992; Tung, 1981; Vertinsky, Tse, Wehrung, & Lee, 1990).

In 1978, Xiaoping Deng, initiated an open-door policy and introduced the principles of a freemarket economy. Throughout its history, China has developed and maintained a unique culture and social values, which have provided a very specific context for the emergence of HRD. Furthermore, other major economic reform have resulted in the diversification of enterprise ownership. State-owned and collective-owned enterprises and multinational corporations, all of which call for diverse human resources, are fast becoming the order of the day. The transitioning nature of the society is catalysing this polarization in the labour market. Although education is highly valued in this regard, however, no formal education system was established until the early 20th century. Since the founding of the People's Republic of China in 1949 and the economic reform in the late 1970s, China has enjoyed tremendous economic growth. Countries have different ways of developing their human resources because of the different contexts from which HRD emerges. Understanding both the past and present contexts is helpful in understanding the emergence of HRD as a national priority in China. In the following we shall briefly discuss some of the major reforms which took place in the economy of China under a certain course of time.

Transitions in Political Structure

The CCP has made every effort to change its internal structure to accommodate economic growth. Wide-ranging reforms have been implemented, including, but not limited to, reforms in stateowned enterprises, the public sector, government institutions, and education. These reforms are cantered on the economy in particular, and the government is making efforts to decentralize its









control for the sake of economic growth (Yang, 2002). In addition, these reforms have initiated decentralization of the centralized personnel system originally adopted in these institutions or sectors.

Transitions in Economic Structure

China moved towards a free-market economy. Its average growth rate of GDP is approximately 7 percent from 1998 to 2003 (Harbison & Meyers, 1964). This steady economic growth has gradually changed the industrial structure of the country. As, China continue to rely on the agricultural industry and its 50 percent employed workforce engaged in agriculture at the end of 2003. Hence, the economic transition initiated industrial reconstruction (Chen & Zhang, 2003). This will lead to emerged diversified forms of enterprises. During the transition (from a centrally planned to a free-market economy), the government commercialized and privatized the state-owned enterprises. In addition, government strategy of free-market economy attracting multinational and foreign-funded enterprise (Kidd,Li, & Richter,2001).

Transitions in Formal Education

Although, China is the most populous country in the world, its government presides over the public-school system at the macro level, delegating general management power to various divisions of local government. The responsibilities of provincial-level governments and city and municipal districts are to implement public school education in areas under their jurisdiction, such as making development plans and teaching plans for local primary and secondary schools. County-level governments bear the main responsibilities for implementing compulsory education, including the overall management of educational finance and the deployment and management of school principals and teachers (China Education & Research Network, 2004). The number of higher education institutions and students in the institutions has increased significantly since the 1990s (Wu, 2004).

A key government decision has been to further reduce illiteracy by providing 9-year compulsory education and opening higher education institutions with increased funding. In pursuit of higher quality education, individuals are willing to pay for continuing education, sometimes abroad at great expense. The educational expenditure of individuals increased from 7% to 11% between









1980 and 2000 (National Bureau of Statistics, 2001). In summary, China has experienced tremendous transition. Although this may be the case for any country during the course of history, a few key elements should be noted, namely, (a) a generally unstable political history and (b) a generally unstable economic history.

Transitions in Human Resource Development of China

Since 1980s, China, like many other economically developing countries, has become aware of the Western concept of HRD. However, as Nadle and Nadler (1982) pointed out, there were literally no HRD organizations or HRD practices in China at that time. Observations and experiences from their research in China have disclosed that (a) training was almost equated to on-the-job learning, (b) education levels were low, and (c) development was found mostly in political programs. Two decades later, China has made progress in developing its HRD functions at the national level. HRD as national policy and strategy bears the following components: (a) It is a top-down approach to achieve the nation's goal of economic growth, (b) it has strong emphasis on social and moral implications, and (c) traditional values of harmony and balance are still strong (Yang, Zhang, & Zhang, 2004).

Currently, under the Belt and Road Initiative, CPEC plays a significant part in booming the economy of Pakistan. However, the economy of Pakistan can only benefit the most unless the capabilities of labour force are streamlined.









1.1 Problem Statement

1.1.1 Where Pakistan Stands?

According to the ILO 2016 report, the 9th largest labour force country Pakistan, exhibits total number of 61 million workers, out of which 94 percent are employed and 6 percent are unemployed with young women comprising most of the unemployed circle. According to the United Nation report, HDI of Pakistan is 0.5, ranked 147 out of 188 countries (UNDP 2016). Pakistan is the country where the sector of HRD or aptitude advancements of labour force is disregarded massively in such a way that the professional and occupational abilities are elevated at an average pace but the innovative, psychological, individual and social capabilities are ignored (Jamil, Hunjra et al. 2014). In Pakistan, the expense on education and vocational training sector is only 2%, out of which a paltry portion of the budget is assigned for HRD actions. Moreover, the education structure is short of strengthening the learner with world of work so does not contribute in HRD (Tabassum 2017).

Pakistan is rich in human capital, but this bountiful human capital is being exploited because of lack in proper attention, planning, development, training and its utilization. It is commonly observed that even most of both public and private sector organizations do not pay proper heed to the HRD and resultantly they fail to deliver the services and businesses. According to the PBS 2013-14, greater part of population is affiliated with informal job sector, but still there is a need of training and development of this informal sector labor force in organized form (Jamil, Hunjra et al. 2014). Furthermore, the HRD for the daily wage earner and the agriculture segment has been disregarded, the working HRD in Pakistan is only cantered with training and education development instead of developing the human resource comprehensively while the public-private partnership and non-profit organizations are more organized as compare to the business or solely public sectors (Tabassum 2017). An upward of nine notified SEZs under CPEC is a welcoming step towards prosperity. In this regard, major reforms are necessary to improve the policies of HRD in order to benefit the domestic workforce at large.









1.1.2 Why China should be the Benchmark for Pakistan

China acquired sovereignty from foreign occupation in 1949, just a year after Pakistan recognized as an independent country from British occupation. Nevertheless, Pakistan implemented democratic political governing system while china adopted socialist administrative political structure, within country. From 1950 to 1978, the industrial and agricultural production has been controlled centrally in china, which stagnated the economy (Ogden 1995). While Pakistan progress was evident in this time period, with high rates of growth in 1960's era with reduction in poverty, agricultural development and manufacturing expansion through industrialization (Anjum and Sgro 2017). Afterwards, China endorsed Capitalist administrative structure by opening it economy for gathering FDI all around the world, but the development of Pakistan's economy remained sluggish. Today, China's GDP per capita reached to 9,800 US dollar while Pakistan's GDP per capita outstretched to 3,100 US dollar only. China and Pakistan encompass massive labour force, with a rank of 1st and 6th in world population respectively. The major proportion of which is estimated to be utilized in CPEC and related projects in Pakistan. The evidence of china's growth can function as a learning example for Pakistan in the aspect of economic growth and development (Kayani, Ahmed et al. 2013). An exemplary strategy is in form of SEZs which are underway to establish in Pakistan.

The study will encompass the following points;

First and foremost, this study will critically *identify the prevailing practices of Human Resource Development in China and Pakistan*, in which, both the formal and technical education will be discussed. Secondly, we shall analyse the *policy reforms and major transitions which took place in the education sectors of China and Pakistan* in a certain course of time and eventually, *portray the lessons which Pakistan can learn from the Chinese education and skill development system*.









2 Historical Development of Pakistan's Education System:

2.1 First Educational Conference 1947¹

In the supervision of Quaid-e-Azam first education conference was convened soon after the independence of Pakistan, 1947. Three major recommendations of the conference were that the *education should be teamed with Islamic values*, secondly, *education should be mandatory and free for every citizen*, finally, *emphasis should be given on science and technical education*. This policy could not be implemented properly due to increase in numbers of immigrants and other problems related to new born country.

2.2 Six-Year National Plan of Education Development: 1951-57²

The plan was presented as "the first deliberate effort to anticipate and provide for our requirements in the various fields of education" it was purposed to make 2.8 million adults literate every year through the Village Agricultural and Industrial Development (V-AID). During that time, expansion of primary school was critically required along with 86,000 additional trained teachers. Two third of children in age group of 6-11 were out of school. It was purposed to establish 24,000 primary schools with 3.7 million capacity of pupils. 1957 was destined to enrol 2/3^{rd of} children in relevant age group. However, the efforts and expenditure in this regard failed to produce the desired results. A major reason accused for the failure is the uneven and unbalanced arrangements of administrative and organizational factors.

2.3 First Five-Year Plan 1955-1960³

The plan of 1955-1960 proposed that, "a system of universal primary education is imperative". Primary education is important to prepare the citizens for the discharge of their democratic and civic responsibilities and to provide them equal opportunities. The plan proposed to add 4000 new schools with increase in number of trained teachers from about 75000 to about 118500 and raise the primary enrolment from 43% to 49%. In this decade we have observed considerable attention to the organization and management aspects of primary education.

³ Government of Pakistan, National Planning Board, First Five-Year Plan: 1955-60, 1957





¹ Government of Pakistan, Ministry of the Interior (Education Division), Proceedings of the Pakistan Educational Conference, 1947.

² Government of Pakistan, Education Division, Proceedings of The Educational Conference, 1951





2.3.1 National Commission on Education 1959⁴

In this commission compulsory education of ten years was made. Recommendations of the commissions were character building, compulsory primary education, focus on science and technical education, national language as medium of instruction, three-year degree program, elimination of illiteracy, introduction of religious studies and a reformed examination system which was combined with internal (25%) and external (75%) evaluation. These proposed recommendations were valuable for Pakistan, however, they were not applied well because of the economic conditions and situation of resources in Pakistan.

2.4 Second Five-Year Plan 1960-1965⁵

Evaluating the performance of first five-year plan it has been stated that: "No significant improvements are found in the quality of school education and in training of teachers". This plan allocated Rs 990 million of the total 5-year social sector outlay to primary education and also prosed to raise the ratio of children in the 6-11 age group attending school from 42% to 50% by 1965. It provided for the opening of 15,200 new primary schools, improve the quality of curriculum, training of teachers, teachers aid and raising the primary enrolment rate from 36% to 56%. In this decade the education of girls received a special attention, presently 1.1 million girls are attending the school out of 4.7 million children.

2.5 Third Five Year Plan 1965-70⁶

Third five years allocated Rs 2652 million of the total 5-year outlay for primary education. The targets of this program was to provide an educational system that facilitate in the era of scientific discipline, technology, political, social and economic development and advance the quality of instruction at all stages.

In this time period serious attention was paid to teachers training, salaries, aids and physical condition of schools. In 1970, third plan targeted to expand the base of primary education and proposed to increase the primary enrolment rate from 45% to 70 %. In West Pakistan 42,500 schools were proposed to set up.

⁶ Government of Pakistan, Planning Commission, Third Five Year Plan: 1965-70, 1965





⁴ Government of Pakistan, Ministry of Education, Report of the Commission on National Education, 1959

⁵ Government of Pakistan, Planning Commission, Second Five-Year Plan: 1960-65, 1960





2.6 New National Education Policy 1970⁷

National Education Policy proposed some salient features like emphasis on ideological orientation, science and technology education, decentralization of educational administration, eradication of illiteracy, and formation of national education units. This policy was not implemented due to the war with India, collapse of the military government and separation of East Pakistan.

2.7 Education Policy 1972-1980⁸

This policy declared that "education will be made free and general up to class X for all the children in both government and private schools". "Primary education up to class V should become universal for boys by 1979 and for girls by 1984" and further that "primary education should become universal up to class VIII". This policy was targeting to build 61,000 additional classrooms with 150,000 trained teachers and recruit 75000 teachers through the National Literacy Corps (NLC). Establishing 276000 literacy centres to educate 11 million persons. In 1972, 40 million adults are ignorant. The 1972 policy was overtaken by the military coup in 1977 and so the priorities shifted. Yet the new education policy was not announced until two years later in 1979.

2.8 Education Policy 1972

This policy aimed to advance the ideology of Pakistan, universal education, equality in education, personality development, curriculum based on socioeconomic needs of society, integrated technological and science instruction, active participation of instructors and students and nationalization of educational establishments. In first phase of 1972 all public and private schools were directed to provide free education up to class VIII. In 1974 free education extended up to class X.

⁸ Government of Pakistan, Ministry of Education, The Education Policy, 1972.





⁷ Government of Pakistan, Ministry of Education and Scientific Research, The New Education Policy, 1970.





2.9 National Education Policy 1979

The purpose of this policy is fostering loyalty to Islam, creation of concept of Muslim Ummah, promotion of scientific discipline and technological training and equal opportunities. This policy was not enforced properly and failed due to lack of preparation and financial resources.

2.10 National Education Policy 1992

The aim of this policy is to encourage the Islamic values through education, improvement in women's education, and range of technical and general instruction at secondary level, demand oriented curriculum, and extend the time frame of graduation and post-graduation, use of AV aids to encourage the private sectors and to enhance the literacy. This policy couldn't be implemented due to changes in the political condition of the country.

2.11 National Education Policy 1998-2010

The aim of this policy was to create Islamic practices as integral part of the training system, achieve the universal primary education, expand the basic training, equal opportunities for higher education, lay emphasis on diversification, variety in the curriculum which should be a continuous process and service training plans. The goals included diversification of curriculum, teacher preparation, upgrading of Madrasa, introduction of multiple text books, development of national testing services and comprehensive monitoring system.

2.12 Education Sector Reforms (2005-2010)

The major reforms in this era are as follows: Free and universal primary education, free text books, gender equality in education, upgraded education curricula, develop the training, learning resources, incentives for private sector, introduce computer classes at all levels, strengthening of research in higher education and grant for the affiliation of madrasas. The policy target to build 190,000 new primary formal schools, 25000 non- formal basic education sectors, 57000 mosques schools and recruit 52,7000 teachers. The policy recognized that the literacy rate is 38.9 % and proposed to raise the literacy rate to 55 % in the first five years and 70% by 2010.









3 Current Education Structure and Situational Analysis of Pakistan

Education system in Pakistan is comprised of primary, middle, secondary, higher secondary and higher education. Primary education is about five (5) years of school from class 1 to 5. Middle level is from 6th to 8th grades. Secondary level is of class 9th to 10th and higher secondary is of 11th & 12th class. After higher secondary, higher education at bachelor and master level starts. Previously, each degree plan consists of two years at university level, but the recently Higher Education Commission has expanded the time duration of all Bachelor of Science degrees from two (2) years to four (4) years. Whereas, professional education in engineering and medicine, the programs are offered at university level, which comprised of four and five years, respectively. Similarly, for other professions, various programs like bachelor and master's degrees in home economics (for girls), agriculture, information technology, and veterinary sciences, etc., are offered. For the development of a skilled workforce, another stream is technical and vocational education, which is comprised of three (3) years of education after matriculation / 10th class and vocational training certificate courses of six months, twelve months and eighteen months duration after 8th class or 10th grade. These diplomas and certificates are offered in almost all technologies for both girls and boys throughout the country⁹.

⁹ http://unesco.org.pk/education/documents/Report_Study_on_TVE_at_Secondary_Level_Pakistan.









Description	Grade/Class	Duration	Remarks
Primary	1st to 5th	5 years of education	Primary Pass
Education	class		, , , , , , , , , , , , , , , , , , ,
Secondary	6th to 8th	3 years of education	Middle Pass
Education	Class		
	9th & 10th	2 years of education	Secondary School Certificate
	Class		(SSC)/ Matriculation
			(Subjects: Science/Humanities/
			Commerce/Technical School
Higher	1141 0 1241	2 more of a hearting	Uisher Secondary School
Figner	$\Gamma \ln \alpha \Gamma 2 \ln \alpha$	2 years of education	Cortificate / Intermediate
Education	Class		(Subjects: Science/Arts/
Education			Commerce)(FA F Sc I Com)
Bachelor	13th & 14th	2 years of education	- Bachelor of Arts / commerce
Degree	13th to 16th	2 years (old scheme)	(BA / B.Com)
Education	(new	4 years of education	- Bachelor of Science (B.Sc.)
	scheme)	(new scheme)	
Master Degree	15th & 16th	2 years of education	- Master of Science/Arts/Commerce
Education			- M.Sc./MA/M.Com
F actoria -	1241. 4 . 1641.	4 f - 1 f - 1	Destates of Environment (DE) /
Engineering	13th to 16th	4 years of education	Bachelor of Engineering (BE) /
Education			Engineering (B Sc. Engg.)
Medical	13th to 17th	5 years of education	MBBS
Education	154110 1741	5 years of education	MDD0
Technology	14th to 17th	2+2 years of	Bachelor of Technology(Pass)
Education		education (old scheme)	+
		4 years of education	Bachelor of Technology(Hons)
		(new scheme)	(old scheme)
			(B-Tech (Honours) is at par
		-	with B.E./ B.Sc. Engineering)
Technical	11th to 13th	3 years	Diploma of Associate
Education			Engineers (DAE) (It is at non with E. S.a.)
Vagational	Oth to	6 months to 2 months	(II IS at par WITH F. SC.)
Education	onward	o months to 2 years	Vocational Certificate (G-II and
	Uliwalu		G-III level)

Table 1 Education System of Pakistan

Source: http://unesco.org.pk/education/documents/Report_Study_on_TVE_at_Secondary_Level_Pakistan.









The current education system of Pakistan is entertaining more than 50 million students around 2 million teachers in almost 0.3 million educational institutes from which 0.19 million are public institution while 0.20 private. Almost 28 million students are enrolled in public institutions while 21 in the private sector. On the other hand, 49% teachers are engaged in private sector while 51% in the public education institute. The ratio of female students enrolled is 44% which is somehow satisfactory compared to 56% of male students. It is noteworthy that the ratio of female teachers is more than the male teachers in totality, however, male teachers are more in the public institutions (Pakistan Education Statistics, 2016-17).

3.1 Trends in the Education Sector

Growth in the education sector of any country is critical for its future generation's human capital. It is therefore, point of interest for the polic makers to identify whether the education institutions are growing in terms of infrastructure, updated education mechanism, or students.

3.1.1 Trends in the Educational Institutions

Considering an increase in the population rate of Pakistan on yearly basis, it should be expected that the education institutions shall grow accordingly. However, the census years 2011-12 to 2016-17 indicates a decline of 6% in the primary schools of Pakistan, while an increase of 2% in the middle schools at that same time of the year followed by a decline of 0.18% in 2016-17. On the other hand, from the total population 64% is below the age of 30 while 29% are between the age 15-29, consequently, the high schools are continuously growing in Pakistan from 2012-13 to 2016-17 with a significant increase of about 7%. While same is the case of higher secondary schools. The factors identified

3.1.2 Trends in the Enrollment of Students

A country is considered successful in its development phase as far as the human capital formulation is considered, enrollment of the students in a particular country is of keen interest and is considered as a major indicator. It is noteworthy that the growth in the enrollment of students in preliminary stages depends upon the literacy rate of the head of household. In Pakistan the situation of enrollment for both male and female have been fluctuating during the time span of 2012-2017. Surprisingly, an increase in the enrollment of boys and girls have been reported 2% and 3%









respectively in the primary schools. Whereas in the middle stage a decline of 1% for boys has been observed, in contrary to a 2% increase in the enrollment of girls in the middle. In the high stage, a drastic increase of 11% and 17% has been reported in boys and girls respectively. Same has been experienced in the high secondary education stage. An illustration of the trends are presented in the following figure (1)



Source: Author's own formulation from the data extracted from the Education Statistics, 2016-17









3.1.3 Trends in the Teachers Engaged



4 Historical Development of Pakistan's TVET

In Pakistan, unfortunately all the development plans and policies were designed keeping in view of the political interest of the governing party, which eventually did not have any sustainable impacts on the socioeconomic status of Pakistan. An initiative of one of the Prime Minister of Pakistan intended to train 1 million people under the Skill Development Initiative (2006-2013) with 2 billion Pak Rupees. But, has been criticized and no evaluation has been borne away.

Major transformation in Pakistan's TVET history, general education to the term of "world of work" was recommended in the framed education policy of 1972-80. It resulted in the induction of agro-technical studies, home economics and agriculture settlements in the country. With the help of financial aid from various international donor agencies, significant development in TVET institution has appeared during 1970s and 1990s, Ansari and Wu (2013). This can be visible in the following table;









Table 2 Development Phases of TVET Institutions

Phase	Implementation Period	Implementation Level
1	1947-58	Initial policy formulation stage
2	1959-70	Expansion and development period
3	1971-77	Experimentation period
4	1977-88	Second expansion period
5	1989-97	Quality improvement period
6	1997-2010	Good governance and self-reliance
7	2009-16	TVET reforms and implementation

Source: Hassan, H. M. (2007)

4.1 Public spending on education, percent of GDP

Years 🗸	Public spending on education, percent of GD	EDU % GDP
2004	1.95	Public spending on education, percent of GDP
2005	2.25	
2006	2.63	3.5
2007	2.64	3
2008	2.75	
2009	2.59	
2010	2.29	
2011	2.22	15
2012	2.14	
2013	2.49	1
2014	2.47	0.5
2015	2.65	
2016	2.49	U 2004 2005 2005 2007 2009 2000 2010 2011 2012 2018 2015 2015 2017
2017	2.76	2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

Over the year there is increase in Public spending on education, percent of GDP in 2004 there is 1.95% and in 2017 it is 2.76%.¹⁰

¹⁰ https://www.theglobaleconomy.com/Pakistan/Education_spending/









Technicl and Vocational Institutions by Province 2016-2017













Province/Regio 💌	Technical 💌	Vocational 💌	Total 💌
Punjab	666	1,170	1,836
Sindh	196	424	620
KP	36	650	686
Balochistan	12	137	149
AJ&K	14	115	129
FATA	10	66	76
GB	9	175	184
ICT	20	98	118
Pakistan 963		2835	3,798



In 2016-2017, Pakistan has 963 technical and 2835 vocational institutions. Punjab has the highest number of vocational and technical institutions.









Year	Enrolment		Institutions			Teachers			
	2014-2015	2015-2016	2016-2017	2014-2015	2015-2016	2016-2017	2014-2015	2015-2016	2015-2017
Pre-Primary	9589.2	9791.7	9976.3		-			-	-
Primary	19846.8	21550.6	22330	165.9	164.6	167	430.9	444.6	453.2
Middle	6582.2	6922.3	7087.1	44.8	45.7	46.7	380.8	394.2	404.8
High	3500.7	3652.5	3865.4	31.3	31.7	32.1	514.2	529.5	539.8
Higher Sec./ Inter	1665.5	1698	1911.1	5.4	5.5	5.6	118.1	123.1	122.6
Degree Colleges	1144.8	937.1	1058.8	1.4	1.4	1.6	36.6	37.1	42.4
Technical &Vocational Institutes	319.9	315.2	317.4	3.6	3.7	3.9	19.4	18.2	18.8
Universities	1299.2	1355.6	1287.9	0.163	0.163	0.164	88.3	83.4	85.5
Total	43948.3	46223	47834	252.6	252.8	257.1	1588.3	1630.1	1667.1

4.2 Enrolment & Teachers by Level¹¹

Over the year the enrolment and teachers by level increases. Technical and Vocational education is an educational activity that imparts academic and technical knowledge and skills to the individuals. During 2015-16, 3,746 technical and vocational institutes with 18,157 teachers were functional at national level. A decrease of 1.5 percent in enrolment was recorded as it decreased to 315,168 in 2015-16 against 319,937 in 2014-15. However, it is estimated to increase by 0.7 % i.e. from 315,168 to 317,399 during 2016-17.

¹¹ Source: Ministry of Professional & Technical Training, AEPAM, Islamabad









4.3 Literacy Rate¹²

Province/Area		2013-14			2015-16	
	Male	Female	Total	Male	Female	Total
Pakistan	70	47	58	70	48	58
Rural	63	36	49	63	36	49
Urban	81	66	74	81	68	74
Punjab	71	52	61	72	54	62
Rural	65	43	53	66	44	55
Urban	82	71	76	82	73	77
Sindh	67	43	56	67	44	55
Rural	53	21	37	51	19	36
Urban	80	63	72	80	65	73
KPK	72	36	53	72	36	53
Rural	70	32	49	70	33	50
Urban	81	55	68	77	52	64
Balochistan	59	25	43	56	24	41
Rural	54	17	36	48	15	33
Urban	74	45	59	76	44	61



The literacy rate of the population (10 years and above) remained at 58% as compared to previous years. The data shows that literacy higher in urban areas (74%) than in rural areas (49%), with male (81%) and female (68%) in urban areas wise data suggest that Punjab with 62% and 55% respectively followed by Khyber Pakhtun-khwa with 53% & Baluchistan with 41%.

¹² Pakistan Economic Survey 2016-2017









Skill development Mechanism in Pakistani TVETs

According to Bhutta (2018), TVET sectors is the key to equip Pakistani youth with critically important skills to enable them not only get employed but will also allow the country to broadly reap benefits of CPEC projects. He further urged the dire need to train locals of Pakistan to extend better employment opportunities and suggested up to date, effective and demand-driven training of youth. Although Pakistan's economy is progressing overall at a steady pace, however at micro-level especially in the scenario of rural communities, there's lack of substantial measures for inclusive employment strategy for women and youth (Lall and Weiss 2004, Shah 2004, Kemal 2005, Khan, Iqbal et al. 2005, Janjua and Mohammad 2008, Janjua 2011, Ansari, Wu et al. 2013, Alam 2015, Bhutta 2018). Whereas rural communities largely comprise of farming that needs diversification in training programs with sensitization about the greater challenge ahead (Hannum, An et al. 2011, Bhutta 2018). Governments involvement at both provincial and federal levels may benefit to launch massive awareness campaigns to help rural communities to cope with the overwhelming scenario emerging in the wake of rapid climate change across the globe (Hannum, An et al. 2011, Bhutta 2018, Ali, Tan Luck et al. 2019). As the development of the nations is largely dependent on the skills training and management, the current disconnect between academia and industry are the foremost barriers for poor job placement statistics even of the skilled workforce (Ali, Tan Luck et al. 2019; The News. 2019).

Pakistan lags behind in meeting international TVET standards (GoP, 2009a), and this situation calls for extensive reforms to meet challenges of global market, and technologically advanced economy (Ansari, Wu et al. 2013). Many countries leading in global workforce have heavily invested in skills development. Unfortunately, Pakistan has fallen beyond in meeting the international TVET standards (GoP, 2009a). Thus, extensive TVET reforms are essential to support it in order to meet the demands of workforce in a technologically advanced economy and global markets. Figure 2 show the percentage of enrolment in Vocational education in different Asian countries.









The education system in Pakistan has two main streams (Shah, 2004). First one comprises of general education system comprising; primary (1st - 5th class), middle or elementary (6th - 8th class), secondary (9th - 10th class), higher secondary (11th - 12th class) and higher education (Ansari & Wu, 2013). The second stream comprises of three years enrollment after secondary level (10th class) into technical and vocational education for skill development of workers and middle level technicians (Bruns 2017, Ahmed, Khan et al. 2018). Besides these streams, there are various certification courses for both genders in vocational training after middle (8th class) and secondary school (10th class) (Janjua & Irfan, 2008; GoP, 2009b).

Review of recognized literature of Government of Pakistan policies, reports and reforms shows that government has been recognizing need for development of TVET sector (Kazmi, 2007; GoP, 2013). In the last few years, numerous steps have been taken to overcome the challenges faced by TVET sector; such as relevancy, access, quality and equity of current TVET practices. For example, in 2005 a national level body, National Vocational Technical Education Commission (NAVTEC) was established for reforming TVET in the country. Afterward, NAVTEC documented a vision in National Skill Strategy (NSS) known as "Skilling Pakistan", which aimed to reform Pakistan's TVET to make it a demand-driven skill (Janju, and Irfan, 2008). Likewise, many steps have been taken to formed provincial bodies, named Technical Education and Vocational Training Authorities (TEVTAs) to promote its vision, Skilling Pakistan. Recently, TVET reforms support programme was launched to support the Government's initiative outlined in Skilling Pakistan to reform TVET sector (GoP, 2013). In Pakistan very few studies have been reported on the TVET especially on the recent TVET sector reforms.

This paper calls for urgent attention of scholars, strategic decision makers, and industry executives to timely invest in reforming Pakistan's Technical and Vocational Education and Training (TVET). According to United Nations Development Programme (2017), growing youth bulge of Pakistani population is 64% which is below the age of 30. This pressing need emerges out of the much-needed requirement to productively engage youth bulge representing major part of total population which resultantly may help in embracing change and building organizational competitiveness in the face of global demands through demand-driven technical education and vocational trainings for productive economic engagement especially in context of China-Pakistan









Economic Corridor projects. If nothing is done, the country risk restless, further engagement in conflict and having many becoming part of a lost generation.









5 Education Structure of China











5.1 Formal Education

The schooling structure in China inaugurates from preschool level that comprises kindergarten education, where the children get enrolled in school at the age of 3 (minimum) and the curriculum encompasses basic Chinese Language, Mathematics and socializing activities. The primary school education is compulsory in China and it remains till 6 years i.e., from grade 1-6. There are 9 compulsory courses included in primary level curriculum: Chinese, Social Studies, Physical Education, Mathematics, Ideology and Morality, Nature, Music, Labor Studies and Fine Arts whereas passing Mathematics and Chinese is mandatory for graduation certificate¹³. Afterwards, secondary education level consist of 3 years of junior secondary and 3 years of senior secondary level schooling. Junior Secondary level comprises grade 7 till 9 and the curriculum includes subjects like Chinese, Mathematics, Foreign Language, Politics, Physics and Chemistry. These subjects are further extended in the Senior Secondary level, covering grade 10 till 12, after which students are supposed to pass Joint Academic Upper Middle School Graduation Examination for graduation. Ministry of Education in 2010, revised the curriculum by including new subjects and divide them into 8 categories i.e., language and culture, mathematics, humanities and society, science, technology, art, physical education and health along with practice activities¹⁴. Subsequently, Higher education system exhibits both private and public institutions of various categories including general and technical universities, professional universities, specialized institutions, medical colleges etc. Tertiary or Higher education system comprises Bachelors, Masters and Doctoral degree programs in many fields of education which are mention in Table 1. In the year 1986, Chinese government took an initiative in order to elevate elementary education and establish culturally and ideologically progressive socialist state, by passing Compulsory Education Law for the country.¹⁵ According to the law, 9 years of formal schooling attainment (which includes 6 years of primary education and three years of lower secondary) became compulsory for every children in the country $(John, 2000)^{16}$.

¹⁶ John N. Hawkins, (2000) <u>"Centralization, decentralization, recentralization - Educational reform in China"</u>, Journal of Educational Administration, Vol. 38 Issue: 5, pp. 442-455





¹³ Source: https://www.scholaro.com/pro/Countries/china/Education-System

¹⁴ Source: https://cdn.shopify.com/s/files/1/0910/3412/files/poster-china-2018.pdf

¹⁵ Source: https://cdn.shopify.com/s/files/1/0910/3412/files/poster-china-2018.pdf





8 7	
Degree Program	Scope of Fields in China
Bachelor's Degree	Administration Studies, Architecture Studies, Art Studies, Business Studies, Design Studies, Economic Studies, Energy Studies, Engineering Studies, Environmental Studies, Fashion, Food and Beverage Studies, Humanities Studies, Journalism and Mass Communication, Languages, Life Sciences, Management Studies, Marketing Studies, Natural Sciences, Social Sciences, Technology Studies, Tourism and Hospitality, Aviation, Construction, Education, General Studies, Law Studies, Performing Arts, Professional Studies, Sport, Sustainability Studies.
Master's Degree	Administration Studies, Architecture Studies, Aviation Business Studies, Construction, Design Studies, Economic Studies, Education, Energy Studies, Engineering Studies, Environmental Studies, Fashion, Food and Beverage Studies, General Studies, Humanities Studies, Journalism and Mass Communication, Languages, Law Studies, Life Sciences, Management Studies, Marketing Studies, Natural Sciences, Professional Studies, Social Sciences, Sports, Sustainability Services, Technology Studies, Tourism and Hospitality.
Doctoral Degree	Business Studies, Economic Studies, Energy Studies, Engineering Studies, Environmental Studies, Fashion Designing, General Studies, Journalism and Mass Communication, Life Sciences, Management Studies, Natural Sciences, Professional Studies, Technology Studies.

Table 3: Categories of Chinese Tertiary Level Degree in different fields.¹⁷

Information about total number of students over the time period at different education level including both formal and vocational education is mentioned in table 2. Table 3 exhibits the information about the distribution of students in different fields of formal education system at Higher education level over the period of time. The table shows that social sciences field of study has been the main focus of students in China since 2011. Moreover, table 4 explains the total number of graduate students at different educational level.

Table 5 exhibits the latest brief picture of education level attributes in terms of number of schools, total number of teachers and total graduates passing from these institutions for the year 2016 and 2017. The statistics has been gathered from *China's Statistical Yearbook 2017* which reflects that secondary vocational education institutions are playing vital role to carter the vocational education need of the country. Under formal education sector, major chunk of primary and junior secondary education institution represents the government efforts to provide compulsory education throughout the state besides increasing number of teachers in these institutions over the year 2016 to 2017.

¹⁷ Source: https://www.bachelorstudies.com/Bachelor/China/









Table 4: Total Number of Students at Different Level of Education.

School / academic year	2012-13	2013-14	2014-15	2015-16	2016-17
Enrolled on education					
Total:	719,509	704,782	665,994	622,156	596,624
In basic education:					
In primary	198,897	195,720	188,371	179,564	174,836
In lower secondary	191,940	181,354	175,037	163,935	153,264
In upper secondary	154,425	151,937	140,042	130,380	127,114
In Gymnasium	130,137	124,619	112,775	104,952	101,995
In Vocational	24,288	27,318	27,267	25,428	25,119
In Post secondary non tertiary	1,686	1,952	2,017	1,521	1,803
In Tertiary	172,561	173,819	160,527	146,756	139,607

Table 5: Number of Student at Different Tertiary Level fields.

	2011-12	2012-13	2013-14	2014-15	2015-16
Educational sciences	32,797	13,349	15,426	13,654	11,236
Humanities and arts	9,490	21,219	20,801	17,588	17,095
Social Sciences	51,624	67,823	66,117	52,551	53,760
Natural sciences	11,585	15,598	15,133	20,033	14,630
Engineering sciences, proccessing & construction	15,002	17,997	18,391	18,728	18,005
Agriculture	11,159	9,987	9,039	10,171	8,383
Health and welfare	20,522	24,267	25,667	22,780	21,387
Services	5,147	2,321	3,245	5,022	2,250
Unknown	1,637				0
Total	158,963	172,561	173,819	160,527	146,746









Table 6: Total Number of Graduates at Different Education Level.

School / academic year	2011-12	2012-13	2013-14	2014-15	2015-16
Graduated on:					
Basic education	50,380	47,819	44,139	44,001	43,084
Upper secondary	40,927	45,899	35,254	39,629	38,583
Vocational	2,844	4,322	3,136	4,702	5,369
Post secondary non tertiary	242	145	164	125	335
Total graduated on tertiary:	29,130	30,365	29,137	33,529	31,530

Table 7: Chinese' Educational Institutions Attributes by Level and Type (Chinese Statistical Yearbook 2016-17)

Year (2016)	Total number of Schools	Total number of Graduates (10,000 persons)	Total number of Teacher (10,000 persons)
Primary Schools	177633	1507.4	578.9
Junior Secondary Schools	52118	1423.9	348.8
Senior Secondary Schools	13383	792.4	173.3
Undergraduates in HEIs	2596	704.2	160.2
Vocational Junior Secondary Schools	16	0.2	0.1
Secondary Vocational Education	10893	533.6	84
Year (2017)			
Primary Schools	167009	1566	594.5
Junior Secondary Schools	51894	1398	345.9
Senior Secondary Schools	13555	776	177.4
Undergraduates in HEIs	2631	736	163.3
Vocational Junior Secondary Schools	16	0.1	0.1
Secondary Vocational Education	10671	497	84

5.2 Vocational Education:¹⁸

In China, vocational education structure is categories in 3 main levels

- 1- Vocational Junior Secondary Schooling: This program focuses on providing basic professional knowledge, technical education and professional skills to students, even to different training workers and employees. For securing admission, primary completion certificate is mandatory and the schooling lasts for almost three to four years of education.
- 2- Vocational Secondary Education: This is an advance level program where students are trained secondary level specialization in basic knowledge, theory and skills of their specialty while practical learning implications are followed for enhancing the technical

¹⁸ Source: http://www.china.org.cn/english/LivinginChina/185280.htm









talents needed for production sector. This schooling lasts for 2, 3 or four years in some programs. The graduates of this level become capable of practice and operation in the manufacturing sector. The admission security requires graduation certificate of junior secondary schooling for this level.

3- Tertiary Vocational Education: This schooling lasts for 2 to 3 years mostly and for some courses it leads to 5 years. The secondary vocational education completion certificate is mandatory for securing admission in this vocational level. This education trait provides the high level specialized technical and management knowledge, and training of practice oriented and craft oriented skills to the learners, directly associated with the industrial and manufacturing sector with the aim of boosting the economic construction. The enterprises vocational training to its employees also cover in this vocational level. Tertiary vocational education provider institutions comprises into four categories i.e., higher vocational technology institution, regular specialized secondary schools, regular and adult higher education institution and reformed regular institutions.

Table 6 shows the list of major diploma and certified courses covered on the secondary and tertiary vocational education level. In China, state plays the foremost role in financing the education sector for both formal and vocational education, as Chinese economy system is decentralized and fiscal matters are the concern of local provincial governments which bear the major share of educational expenditure. According to the findings of Statistical Yearbook China 2012 for formal education sector, 75% of the total expenditure is borne by the local government, 21% is by income from teaching and research sector, 3% by other educational funds, 0.55 by donations and fund raising and 0.54% from private sectors. For vocational institutions the figures are quite similar: 71% by government finance, 24% by income from teaching and research, 3% from other educational funds, 0.95% by private sector and 0.19% is via donation and funds respectively. Furthermore, the government of China took initiative in terms of national scheme for making secondary vocational education free of cost by introducing subsidy of 1,500 Chinese Yuan annually for a student especially from rural side or for low socio-economic status individuals.¹⁹

¹⁹ Source: http://www.oecd.org/countries/honkong.China/46581016.pdf









Table 8: List of Some Major Courses Covered in Vocational Education in China.

List of Vocational Courses	Chinese Cuisine, Home and Property Management, Plumbing and Air-conditioning,
and Diploma	Technical Maintenance and Electrician, Computer Networking Technology, Electronic
	Commerce, Graphic Designing, Computerize accounting, Computer software design,
	CNC tooling making, Auto Repair, Numerical Control, Urban Railway System
	Control, Urban Rail Transit Management, Mechatronics, Industrial Product Design
	Culinary Arts and Management, Hotel Operations Management, Professional
	Accounting, Public Relations and Management, Sports and Recreation Management,
	Advertising, Fashion designing, Horticulture and Landscape Management, Landscape
	Architecture, Product Designing, Architectural Design, Furniture and Lifestyle
	Products Design, Jewelry Design & Technology, Jewelry and Image Product Design,
	Stage and Set Design, Advertising Design, Creative Design, Digital Music and Media,
	Film & Television, Publication Design and Print Media, Transmedia, Visual
	Communication, Visual Arts and Culture, Visual Design for Journalism, Costume
	Design for Performance, Fashion Branding and Buying, Fashion Media Design, Digital
	Electronics Technology, Automotive Technology, Aircraft Maintenance, Watch and
	Clock Maintenance, International Hospitality Management, Tourism Management,
	Accounting and Management, Diploma in Business, Diploma in Agricultural
	Economics and Management, Agricultural Entomology and Pest Control, Clinical
	veterinary Medicine, Crop Cultivation and Farming, Crop Genetics and Breeding, Food
	Science, Land Resources and Management, Pesticide Science, Plant Nutrition, Plant
	Pathology, Preventive Veterinary Medicine, Soil Science, Vegetable Science.

Source: https://en.wikipedia.org/wiki/Category:Vocational_education_in_China









6 Historical Overview of Development in Education Sector of China since 1949²⁰

6.1 1949-57

This is the first plan period of the new born country which can be termed as a reconstruction time period, as People Republic of China emerged as an independent state on globe in 1949. Under the leadership of Mao Zedong, a unified political party took the charge of state governance and declared country as a communist state. With the aim of national reconstruction, the government built new constitution for the state in 1954 replication of Soviet constitution model. Under this constitution, building of national education system initiated with below mention points:

- Nationalization of all education institutions at various level in 1949-1952.
- Centralized planning and financing of education sector (including admission, placement, management and funding).
- Popularize Chinese language with-in education sector in 1955.
- Established a target of achieving universalization of primary education in 1956, structuring a consistent and qualified teaching force along with revising primary level curriculum in 1955.
- Focus on quality improvement of secondary level education by expansion of secondary education institutes, reconstruction of secondary technical schools in 1952-1954 and skilled worker schools in 1953-1957.
- Introduced model of developing higher education including nationalization and reconstruction of institutions, adaptation of Soviet model pf higher education and sending students to Soviet Block for advance studies.

6.2 1958-1965

This tenure can be termed as 2nd plan and adjustment period for China, as the founding father Mr. Mao Zedong open on to the national experiment "Great Leap Forward" to accelerate development process in 1958-1960. During this period, the political relations breakoff

²⁰ Tsang, M. C. J. C. r. (2000). "Education and national development in China since 1949: Oscillating policies and enduring dilemmas." 579-618.









happened between China and Union of Soviet Socialist Republic and China faced economic decline and inefficiency. Whereas, the major education policies forwarded by Chinese Communist Party (CCP), and development in the education sector during this time period, is briefed as follow:

- The agenda was forwarded about serving the working- class people with education to eradicate the adult illiteracy, increase the enrollment of primary education, bringing the basic education to the peasants and prepare elite class via secondary/university education at the same time.
- Emphasis on promoting political and ideological education.
- Reforms in secondary education system were introduced via expansion of agricultural schools, inclusion of manual labor and practical study programs in schools and experimentation of alternative education programs under secondary level.
- Rapid expansion in higher education system via providing access to higher education for all qualified and willing youth, increasing the number of institutes from 229 to 1289, revising the curriculum by reducing the theoretical education and introducing social activities and manual labor work.
- Expansion of vocational education system by introducing secondary vocational schools in urban areas in the year 1963.

6.3 1966-1976

This is the Cultural Revolution period in China in where the government initiated to reemphasize the collective incentives from economic production. The former policies were taken into account as the way forward in education sector (like emphasis on political and ideological education on every level, linking practical knowledge with theoretical education, joining academic education with manual labor and directing educated youth outside the country for higher education) along with new proposed policies as well. The policy of reforming higher education sector took place in this time period by introducing innovative national examination scheme for admission in university, ceasing admission of undergraduate students in further education for next 6 years and of graduate students for 12 years and employing that youth in workforce, 1970 initiative of bringing youth of peasants and working class background to attend university education and 1971 plan to reconstruct 106 pre-existing institutes of higher









education. Shutting down of many secondary schools, vocational technical institutes in terms of reconstruction of the education institutional sector. In 1976, the death of leader Mao Zedong leads the country towards new reform and opening up period for the state with policies having emphasis on economic development establishment of special economic zone in different region of country. In education sector, the focus of new leader Deng Xiaoping's was to emphasis on education development and harmonized it with national economic development via focusing on the construction and regulation of primary, secondary and higher secondary vocational institutions. Moreover, experiment of decentralization of the education sector's management and finance, and emphasis on educational quality at all levels.

6.4 1980's and Onwards

In 1983, the leader of the State Mr. Deng Xiaoping brought the idea modernizing education sector, that can help the nation to face the world and face the future as well. In the year 1985, the initiative of achieving 9 years of compulsory education by the year 2000 to eradicate illiteracy and promote youth education, opening up new windows of opportunities for graduates via sending them to United States for higher education, introducing practice and experiments disciplines of science and technology within education sector in 1995, development of 100 key universities with introducing modern disciplines in 1993, reform in the pedagogy of education sector special focus on students self-thinking and creative learning, promotion of 9 years compulsory program in rural and poor areas with government subsidies, higher secondary and university enrollment expansion by 2010, extraction of power over education sector to provincial governments on higher education affairs, projects of developing high level creative personals and translating nationalization to privatization of education sector via encouragement on development of private education institutions.

Below is given the figure extracted from Chinese Statistical Yearbook, exhibiting the number of institutions at higher education and senior higher education level for 30 years. The table shows a pure picture of government initiatives of developing higher education by increasing the number of universities and empowering the youth with vocational skills by rising the vocational institutes with in the country.









Years	Higher Education	Senior Secondary	Senior Vocational Education
	Institutes	Schools	Institutes
1975	598	49215	2760
1985	1016	17318	14190
1995	1054	13991	22072
2005	1792	16092	14466

In sighting the Technical and Vocational Education Training (TVET) system in China, comprehensively designed, and accounting different aspects like providence of vocational education at different levels, training of vocational trainers, adult training retraining and linking industrial sector with skill education. The TVET system of China became a focus of attention sector by state after the industrial revolution of 1980's era, in order to ready the skill labor force for industries operation. After accomplishing the compulsory 9 years education initiative, in 2009, the state set Vocational Education and Training VET as a next target to achieve in order to meet the industrialization and employment challenge. Moreover in 2009, the State Council Report found following deficiencies in prevailing TVET system of country i.e.,

- System contains gap between supply and demand in skill manpower to meet the needs of the economy.
- Flaws in the management and administrative structure.
- Substandard teaching quality and inadequate trained teaching staff.
- Absence of tertiary and secondary VET synchronization and coordination with other education level.

Because of these challenges, 2010-2020 State Master-plan initiates to raise the vocational education sector with the decision of offering free of cost secondary vocational education and subsidies to the student of low income status, providing dual certificate of diploma and professional qualification to the student of vocational institutes, initiative of increasing the number of trainees and schools in state, raise the number of VET courses and providing awareness programs to the general public about benefits of VET. The state council also planned different measures to increase employment-oriented skills training via

• Raising awareness of the important and necessity of employment-oriented skills training.









- Promoting skills training in multiple forms and on multiple levels
- Improving the quality of skills training in effective way
- Strengthening leadership and management of VET system.

Under the caption of 12th five-year plan (2011-2016), initiatives like promoting VET system to the rural areas, merging classroom learnings with workplace training via connecting VET schools and enterprises, dual qualification program for teachers i.e. offering certification in the field of teaching and occupational skills and collaborative training programs with foreign countries. Few compressive offering programs were initiated for the industries in this regard, i.e. tax breaks on land acquiring for the industries which ensures the investment in associated vocational schools and provide related equipment. Furthermore, technological parks have been introducing to achieve the objective of enterprise and vocational school cooperation. The focus of state was to execute the vocational education system as per the need of industry which can absorb the trained individuals from labour market, and to address the problem of unemployment from the economy.

A comparative review of skill development mechanism

Training need assessment deem to be an important determinant of effective training programs from capability perspective (Zahid Iqbal and Khan 2011). Extant literature suggests that in vocational and technical training, an appropriate training need assessment is pre-requisites to have dynamic workforce, social and economic development of a country (Mouzakitis 2010, Kingombe 2012, Ngure 2013, Rodrik 2014, Bruns 2017, Asadullah and Zafar Ullah 2018). According to Munro (2007), technical education and vocational training can be broadly referred to development of ways to learn and acquire skills and attitudes which facilitate success at work. UNESCO (United Nations Educational, Scientific and Cultural Organization) refers Technical and Vocational Education and Training (TVET) as 'those aspects of educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic life' (Dewan 2017). This implies that TVET comprises of apprenticeships, on-the-job trainings, vocation education at secondary schools, sector specific institutes, and streams of vocational education within comprehensive schools (Van der Meulen Rodgers and Boyer 2006, Ngure 2013).









Human beings are the most valuable of all capitals to invest in (Marshal 1920, Leung, Stampini et al. 2014, Berends and Deken 2019). As referred by the proponents of Human capital (Schultz, 1961; Becker, 1964; Lucas, 1988; Romer, 1990), it is the major component to have quality performance, and higher productivity and education and training are suggested as one of the most important investments made in human capital. Over the last couple of the decades it has been evident that opportunities pertaining education, training, and skill level up gradation are critically important not only at organizational but national level to accelerate performance in this era of global competition (Finegold & Soskice, 1988; Porter, 1990; Keep & Mayhew, 1999; Ashton & Felstead, 2001; Rodrik, 2014; Wright, Coff et al. 2014).

To better understand the concept, Technical and Vocational Education and Training (TVET) is referred to educational and training arrangements that enable people to get employed and make productive contribution in different economic areas (Finch and Crunkilton 1999, Ashton, Green et al. 2005, Janjua 2011, Ansari, Wu et al. 2013, Spring 2015). TVETs have been perceived to be "master key" in education for sustainable development by diversifying career choices (Neuman and Ziderman 1991, Bradley and Nguyen 2004, Jallah 2004, Ainsworth and Roscigno 2005, Spring 2015); Morgan 2012, Ansari, Wu et al. 2013). This has been done through reaping demographic dividend, making investment in HRD and promoting entrepreneurship for sustainable citizenship and social development (Jallah 2004, UNESCO 2004, Ansari, Wu et al. 2013). Many developed and developing economies have been opting for uplifting TVETs as part of their education development strategies (Tabbron, and Yang, 1997; Grierson and Young, 2002; Rodrik 2014). As also acknowledged by UNESCO (2010) TVETs can reduce labor migration by including semi-urban areas and marginalized communities across the world, by providing access to metropolis and resources thus minimizing socio-economic inequalities (Ansari, Wu et al. 2013, Bruns 2017, Ahmed, Khan et al. 2018).

Technical and Vocational Education and Training are increasingly becoming critical policy issues in developing economies (King, 2009; Palmer, 2009). As it has been widely acknowledged that students equipped with job specific skills are more productive to execute tasks they have been trained for (Van der Meulen Rodgers and Boyer 2006). Indeed, the secret of Asian Tiger's (Japan, Korea, Singapore and Taiwan) remarkable economic performance during 1970s-1990s was thoroughly trained, well-educated, conscientious and hard-working workforce (Ashton, Green et al. 2005, Spring 2015). Their government policies included









technical skills training in post-secondary education with focus on up to date disciplines related to state-of-the-art technology and vocational which created a strong human capital base to meet business demands in face of fast paced economic progress (The World Bank, 1993; Ansari, Wu et al. 2013). Additionally, countries like Japan, South Korea, and Taiwan have heavily invested in vocational education to address challenges in terms of scarcity of skilled workforce (Tilak, 2003). Thus, having stringent quotas and entrance examinations in practice allows these countries to limit enrolments at university level while encouraging TVET education system (Van der Meulen Rodgers and Boyer 2006). Resultantly, their economies are well supported through enhanced industrial and economic progress because of dynamic and vibrant skilled workforce for mid-level careers (Van der Meulen Rodgers and Boyer 2006). This implies that quality skilled workforce equipped with up to date vocational education and technical training has been hallmark to the successful export drives of those economies, despite of high labour intensity in industrial exports.

Pakistani youth has been among the most affected by the financial crisis (2007-08) and consequent global recession (2008-09) and in this regard, Eichhorst, Rodríguez-Planas et al. (2015) calls vocational education and training as the 'Silver Bullet' for the joblessness youth of a country. According to UNDP (2018), in Pakistan, 76% of youth drops out of education system due to financial reasons and look for a second chance at education. Although, Pakistan as a developing economy with rapid population growth rate and huge bulge of youth age between 15-24 years, marks significant potential for TVETs to enhance sector capacity by delivering demand-driven training opportunities to youth as per modern labor market (Shah 2004, Ashton, Green et al. 2005, Kemal 2005, Janjua and Mohammad 2008, Janjua 2011, Ansari, Wu et al. 2013, Ali, Tan Luck et al. 2019). However, it is noted that output of TVETs' services for enhancing technical and vocational education has been insufficient to meet modern labor market demands (Shah, 2004; Janjua and Irfan, 2008). Pakistan's Labour Force Participation is reported low at 44% as compared to other developing economies (Ansari, Wu et al. 2013). Resultantly, major portion of our population is left unemployed impacting education, health, and quality of life (Janjua and Mohammad 2008). Janjua (2011) here argues that although the Government of Pakistan (GoP) has been significantly working regarding planning and policy for Technical and vocational skills development (TVSD), but the relationship between TVSD and poverty alleviation is neither automatic or that simple. Hence the ascribed economic (national economic growth, GDP, economy competitive) and social









(intensive job growth, poverty alleviation, and social infrastructure, political stability) outcomes need country evidence to build the relation between formal education, poverty alleviation and TVSD (Ashton, Green et al. 2005, Cooke 2005, Aggarwal 2007, Rodrik 2014, Bruns 2017, Tang 2019).

The objective of this paper is to examine training need identification mechanism in vocational and technical training in Pakistan in particular and in Germany and China in general to build a comparative review and learning lessons. This study is aligned with Pakistan's National SDGs Framework (2018) that identifies vocational education and training as anchor of economic prosperity while eliminating gender disparity by 2030 in education with equal access to education and vocational training across all levels especially for the disadvantaged (e.g., persons with disabilities, indigenous people, children in vulnerable situations) segments of population. The objective of this study is also a reflection of key cooperation areas under Long-Term Plans (LTPs) (2017-2030) within China Pakistan Economic Corridor coverage. These LTPs note that as part of long-term plans, the social and economic development cooperation needs to be supported with efforts in vocational skills and technical training and related education and research exchange for transfer of technology between Pakistan and China with reference to Xinjiang's "Academy of Central Asia Regional Economic Cooperation". It implies that a training need assessment (TNA) of the vocational skills through a better skill identification mechanism may serve Pakistani personnel by providing an accurate assessment of training needs and boost employability. This may suggest answers to the subsequent challenges faced in forms of skills mismatch, aging workforce, disparity in accessibility of training, and updating curriculum across all trades especially when working with China under CPEC projects.

Gender	1980s		1990s		2000		2010		2017-18	
	Pakistan	China								
Overall			50.73%	79.13%	51.01%	77.22%	51.56%	70.97%	54.44%	68.43%
Labor										
Participation										
(All ages)										
Male		91.01%	59.24	90.07%		89.29%		86.09%	48.32	
Female		81.74%	2.23	83.83%		80.11%		74.21%	14.52	

Gender-Specific Labor Force Participation in Pakistan and China

(Xi 2017)









7 Conclusion and Lessons for Pakistan

From the preceding three sections the reader may be excused if she got the impression that all is well with China's TVET system. There is enough evidence from surveys to suggest that the situation is more complex. Thus, the American Chamber (AmCham) China reports that aside from rising labour costs, high turnover rate, and the impact of regulations, the severe shortage of appropriately skilled employees is among the human resource challenges that remain a major concern for AmCham China members. Out of 266 members surveyed in 2012, around 70% reported they encountered difficulties in attracting and retaining skilled as well as technical staff. According to AmCham China (2011), quality and mobility of the skilled labor pool in the PRC are seen by domestic and foreign firms as long-term challenges despite significant efforts by the government to improve the quality of skilled workers. Despite the rapid increase in skilled workers to a total of 45 million over the past 30 years, the shortage of skilled employees across all job types persists (Lee, 2014). In 2013, more than a third of the Chinese firms surveyed said they struggled to recruit skilled workers, with 61% of these companies attributing this to a shortage of general employable skills (Chen et al. 2013).

Two main reasons cited by many employers behind this shortage are skills mismatch and inappropriately skilled university graduates in the face of growing demand for skilled labor (AmCham China 2011). In addition, the rapid growth of state-owned and private enterprises in the PRC represents an additional challenge in the supply-side. These issues constrain the flow of investment and expansion of businesses in the PRC.

Clearly, Chinese firms also face skill-related problems. The reasons are not hard to find: sustained growth of the economy at 10% per annum for three decades has intensified the demand for skilled workers, and as wages have risen, the search by firms for more skilled workers has increased. It appears that as the Chinese economy moves up the value-chain ladder, the search for more and more skilled workers will only increase. However, compared to the stage of development of manufacturing in India, there is much to be learnt from the already achieved success of the Chinese TVET system, and its ability to supply the skilled workers required for China having become a manufacturing hub of the world, at least in respect of low cost, low technology items, though increasingly Chinese industry has moved up the value chain as well.









The preceding sections highlighted the key features, major reforms and financing of the Chinese TVET system. In light of the similarity in challenges faced by Chinese administrators at an earlier stage of development, we can draw significant lessons from the Chinese experience for the central/state governments in India, as well as the private sector. To reap the benefits of the demographic dividend, available to India only till 2040, it is crucial that the skill development needs of our workforce, and demand for skilled workers are addressed. The high growth of manufacturing and the Chinese economy are in part attributed to the efficiency of the Chinese TVET system and the State's commitment of legal and monetary support to technical and vocational education. It has been argued, based on other primary surveys we have conducted in India, that when industry fails to find semi-skilled and skilled staff, they have had to adopt more capital intensive methods of production, thus displacing labour with machines (Mehrotra et al, 2014). This may enhance productivity, but this reason for adopting capital-intensive methods, albeit such methods increase productivity, is questionable in this case as it is driven mainly by the sheer shortage of skilled workers. Thus, reforming our skill development system is particularly pertinent for India if manufacturing jobs are not to be lost due merely to the shortage of skilled personnel, which drives up wages. In fact, more skilled workers will only enhance productivity, and equally importantly the quality of output, thus enabling manufacturing as well as services to move to a higher growth trajectory, which can create more jobs in the future. This is especially true of manufacturing, whose share in GDP and employment has remained stagnant for over two decades. In fact, one of the lessons of the Chinese TVET system is that jobs can be created in manufacturing precisely at the same time as productivity is growing.

The Vocational Education and Training Law

The enactment of the 1996 Vocational Education Law of the People's Republic of China has been the landmark step for the Chinese TVET system. As was discussed in earlier sections, the Law has the provisions for integrating education and training with the industrial process with the participation of local enterprises. In addition, it provides for adult training as well as vocational education and training in rural areas.









Many other countries have such an Act to ensure legal backing to vocational education and training in their countries (for example, Australia, UK and Germany). A similar Act should focus on all tenets of the skill development system laying out the specific responsibilities of the Centre and the state on the one hand, and skill providing institutes and industry on the other hand. The aspects of regular revision of curriculum in line with local industry needs, certification, and teacher training should also be included into the Act. The Act in India should be comprehensive and plan to take into account every aspect of vocational education and training – vocational education in secondary schools, in higher

education colleges, vocation training in training centres, adult training and retraining for those already in labour force, training of vocational trainers, curriculum design, industry participation and financing of VET.

Currently all certification that is recognized is offered by government institutions in India. However, if TVET is to become more widespread, rather than merely supplying workers for the organized sector activities, the government has to permit the recognized and accredited institutions in India in the private sector to provide certification. A VET law in India should take into account the need for private Chambers and Sector Skills Councils offering certification.

The Integration of Manufacturing and Skill Development

If China is a manufacturing giant in the world, it has partly to do with the policy-makers' ability to: a) build a foundation of VET over many years; and b) continuously upgrade the TVET system in response to China's growing manufacturing share in world manufacturing output. India is planning to increase the share of manufacturing in GDP from 16 per cent in 2009-10 to 25 per cent by 2022. Thus, while the 12th Five Year Plan in the Industry Chapter has articulated the need for an Industrial Policy, the skills or TVET preconditions for such an industrial policy also need much more careful elaboration than has happened so far. The most important lesson from the Chinese experience is that the sheer scale and size of their TVET system dwarfs India's.

India's National Skills Policy (NSP) (2009) is being reviewed and the experience of China must be used in redefining the NSP. India cannot match the scale and size of China's TVET system without ensuring that India's

10,000 secondary/senior secondary schools have a vocational education stream. Currently,









vocational education is offered only at the senior secondary level in India (i.e. classes 11-12). Two years ago the Ministry of Human Resource Development of the Government of India had approved a National Vocational Education Qualifications Framework which mandated the inclusion of vocational education from class 9 (i.e. to start immediately after children complete the compulsory eight years of general academic school till elementary level) (Mehrotra et al, 2012). However, that has been introduced in only 2000 or so secondary schools in 22 States so far (at the time of writing in late 2014).

Clearly, age 15, when Indian children are entering class 9, is the start of the working age, according to Indian law. So, many children drop out after completing eight years of elementary school, and many well before that. Starting a vocational stream in every secondary school in India would begin to match the Chinese system that has existed for decades. As we noted, half of all children completing 9 years of compulsory schooling in China enter senior secondary vocational schools. In India the comparable share at senior secondary level is 5 per cent (of a smaller base).

Stipend for Vocational Students – not for general academic schooling

In India, like in China decades back, very few students opt for vocational stream, which is often perceived as a dead-end. Only about 5 per cent of the population in the age groups 19–24 years has acquired some sort of skills through vocational education in India (Planning Commission, 2013). Encouraging students to opt for vocational stream in secondary high schools through measures like stipend for rural students for board and lodging, making tuition fee free of cost (since 2009) for all students has shown very positive outcomes for China's vocational education. Around 95 per cent employment rate of senior secondary vocational school graduates speaks for the external efficiency of China's TVET system. In India, as we noted above, at the beginning of the 11th Plan only 5 per cent students were enrolled in vocational courses at the secondary level (Planning Commission, 2013).

Teacher Training

Improving the quality and enhancing employability after the completion of vocational education or training will also increase the attractiveness of TVET in India. As of now, only around 15-20 per cent of vocational graduates are employable at the completion of their









academic programmes (BCG CII, 2013).

A significant achievement of China's TVET system has been the element of training of teachers/trainers at the vocational education and training schools and institutes. Teachers in vocational schools are required to undergo one month in industry each year, or two months every two years for their career progression and promotion. The practical training at the enterprises equips them with latest technology and evolving industry needs. In India, around 32 per cent of the trainers in vocational institutes do not have any formal certificates. A significant proportion of them has neither the requisite teaching skills nor the relevant industry experience. Due to poor career growth prospects, attrition rate is also high among faculty in vocational institutes (BCG CII, 2013).

The 12th Five Year Plan recognizes

the importance of training of trainers for effective functioning of TVET system. The scheme of Vocationalization of school education envisages the provision for in-service training of 7 days for 2,000 existing vocational education teachers and induction training of 30 days for 1,000 new vocational education teachers (Planning Commission, 2013). Clearly this limited exposure to practical training for TVET teachers in India is not sufficient, and should be evaluated, and adjustments made if necessary.

Curriculum Design

In China, local industry participation is encouraged and has been provided for in the 1996 Vocational Education Law. The curriculum of a senior secondary vocational school is designed such that, one- third includes general academic skills defined nationally by the Ministry of Education, another one- third is again nationally defined content associated with the particular occupation, and the remaining one- third defined again with respect to the occupational field is determined locally at the school level with the help of local enterprises. This shows the flexibility of the Chinese TVET system, that curriculum for each trade has a local content. There is no such flexibility permitted in either ITIs (of the Ministry of Labour) in India, nor in senior secondary vocational schools (Mehrotra, 2014).









In China, to ensure that curriculum is responsive to industry demands, the focus and distribution of

trades in the curriculum for primary, secondary and tertiary sectors is in line with the economic structure. For instance, in Chongqing, the shares of primary, secondary and tertiary sectors are 8, 55 and 37 per cent respectively. Accordingly, the focus of trades in the curriculum for the respective sectors is 7, 52 and 41 per cent respectively (Chongqing Municipal Education Commission). Again, this kind of flexibility and responsiveness to local need and demand would be unheard of in the Indian TVET system. Thus, for an ITI principal to introduce a new course in India is such a tedious, bureaucratic and cumbersome process, requiring approvals all the way up to the state capital that no ITI principal would attempt it. By contrast, we noted in Chongqing that the city has become a world manufacturing hub for laptops, mobiles and automobiles (one third of the world's laptops are made here). The TVET system in the city is totally geared towards meeting the needs of these manufacturing sectors. By contrast, in India, the border district of Gurdaspur (Punjab) has 800 foundry forge units but the town's ITI has no course that might cater to the unit's needs for skilled manpower.

Responsiveness to local industry need and Industry participation

The local governments in China try to attract the support of the enterprises in TVET. The local enterprises because of fear of punishment (taxation or negative publicity or mark on reputation) at the hands of local governments (empowered by the provisions of the 1996 VE Law) do participate in practical training. The local governments help local enterprises by incentives such as allotment of land at subsidized prices, or preferential treatment in case of award of government projects. Such measures prove to be influential in encouraging industry to actively participate in vocational education and training and can be adopted in case of Indian firms as well.

In India, there is a huge demand for skilled workers compared to supply, especially in terms of engineering and managerial talent. Both the government and industry need to invest in training infrastructure and vocational education & training. Enterprises should come forward with collaborations with training institutes and should look inward to assign priority to inservice and pre-employment training and skilling (BCG-CII, 2013). Industry should consider









offering their staff as trainers/instructors and master trainers to TVET institutions in India, since teachers are in short supply in both ITIs as well as vocational secondary schools.

Due to years of underinvestment in skill development, India has one of the least skilled manpower among the top manufacturing nations. Only 17 per cent of those entering the workforce are skilled (including higher education and vocational education, which is only 4 per cent). Compared to this, in China, 59 per cent of those entering the workforce are skilled, of which 39 per cent are vocationally trained. Even more worrying aspect on quality grounds is that among those who are skilled, only 5 per cent workers can be classified as highly skilled and around 64 per cent are considered skilled at very low levels. Over 65 per cent of Indian firms face difficulty in filling job vacancies with appropriately skilled workforce. The skill gap is expected to worsen and reach about 100 million by 2025. This can prove to be a serious hindrance for achieving the targets of New Manufacturing Policy.

Financing of TVET

The 1996 Vocational Education Law requires that 20 per cent of the annual education budget should be allocated to vocational education and training (Lai et al, 2011). The fiscal decentralization of the Chinese (unitary) system of governance and autonomy of the local governments play an important role in the implementation of vocational education, for vocational education at the secondary and senior secondary level is the responsibility of township and county governments, while higher education is under the central and provincial governments. The local governments set aside a special sum or arrange a portion for vocational education and in addition can appropriate more funds for rural vocational training.

To overcome the financial burden and to ensure that the poor Chinese students continue in VET schools a subsidy of 1,500 Yuan per year is offered per student, for their first two years at secondary vocational schools to cover their fees. Since 2009 tuition fee for senior secondary vocational schools was made free of cost for all students. This policy initiative is particularly relevant in the case of India, where graduates from vocational training providers indicated that they are usually from poorer economic backgrounds with household incomes of Rs. 5,000 and below (Mathur et al, 2014).









Finally, all enterprises in China as a policy are required to utilize 1.5 per cent of their payroll towards in-service training, which if they fail to do, should contribute an equivalent amount to the government to be used towards adult training. There is a strong case for developing National Training Fund and this has been recommended in India's 12th Five Year Plan (See the chapter on Employment and Skill Development, Chapter 22, Vol.3; see also Mehrotra and Ghosh, 2014). The Plan envisages setting up a training fund, in the form of tax levies to be collected from large and medium enterprises (to begin with), for mobilization and allocation of resources for skill development. The financing of skill development in India through a training fund should also consider subsidizing poor students to pursue vocational education and training.

- Need of HRD implementation in all segment of labor market
- Availability of HRD equally to permanent and contract employees in all sectors.
- Urge of incorporating HRD in labor policies and to develop labor capital in Pakistan
- Proper check and balance on HRD investment by government.
- Increase in literacy rate and raising standard of education
- Investment in gender diversity and increasing women's labor force participation is also obligatory for consideration, for the HRD in Pakistan
- Need of a separate institute to regulate human resource structure in country.

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