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Linking TVET with Industries in Bangladesh: Need for Supportive Policies and an Approach to TVET

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Abstract: While TVET is critical for development, there is a gap between skill development and employment, especially between TVET and industries in Bangladesh. As such, the study was intended to find out the supportive policies and an approach to TVET in order to link TVET with industries. The study was basically a qualitative study in which both primary and secondary data were used. Primary data were collected through semi-structured interviews with twelve purposively selected respondents working in various Government agencies and TVET institutions in Bangladesh. The study has indicated that the collaboration between TVET institutions and industries, and supportive public policy are necessary in order to link TVET with industries. Supportive public policy involves ensuring industries' participation in designing curriculum and training, updating curriculum and training in response to market needs and changing technology, introducing dual system with strong focus on workplace learning, and public employment service, implementing National Skills Development Policy-2011 and National Skills Data System, and so on. The study has argued that the collaboration between TVET institutions and industries, and supportive public policy will create an enabling environment that would link TVET with industries in Bangladesh. Finally, the study has proposed a partnership-based approach to TVET where both the partners – TVET institution and industry – will work together and undertake joint initiatives based on mutual commitment and shared responsibility to promote formal and non-formal TVET in Bangladesh in line with labour market needs and technological changes.

Keywords: TVET, dual system, learning model, policy, industry partnership

1. Introduction

Technical and Vocational Education and Training (TVET) is the combined process of all vocational education and technical training activities which aim to promote workplace learning and enhance occupational skills of the individuals. United Nations Educational, Scientific and Cultural Organisation [UNESCO], (2003) proposed that TVET involves the acquisition of practical skills, attitudes, understanding, and knowledge related to occupations in various sectors of economic and social life. TVET has two main objectives: first, is social which is pertaining to training and integrating young people within the labour market, second, is to contribute to the development of economy and employment (UNESCO, 2018). As such, TVET has long been recognized as a key component of human resource

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development (HRD) and a vital tool for socio-economic development (Asian Development Bank [ADB], 2008; Nilsson, 2010; Pavlona, 2014; Pongo, Effah, Osei-Owusu, Obinnim, & Sam, 2014; Rao, 1996; Seng, 2007). Moreover, TVET could be a powerful catalyst for achieving SDGs by 2030, especially eradicating poverty, promoting lifelong learning opportunities and creating employment and decent work for all (McGrath, Alla-Mensah, &Langthaler, 2018; Paryono, 2017; Edokpolor & Owenvbiugie, 2017; Maclean, Jagannathan, & Sarvi, 2013; Kronner, 2005). As such, like in other counties, TVET has become an integral part of Bangladesh's HRD policies, especially National Education Policy-2010 and National Skills Development Policy-2011 (ADB, 2015; International Labour Organisation [ILO], 2012a, 2012b, 2015a; Ministry of Education, 2010, 2011; Ministry of Finance, 2019). The population of Bangladesh is relatively young since roughly 32% of the total population belong to the age group below 15 years, and about 33% of the total population belong to '15-34'age group. Moreover, youth aged 15-29 represents 25.6% of the total working-age population (Bangladesh Bureau of Statistics [BBS], 2018). Hence, Bangladesh could profit from *demographic dividend* to foster economic growth and development by converting its relatively young population into human resources through organizing diversified TVET programs in line with industrial demands and technological changes (ADB, 2016; Khan, 2019; Khatun & Sadaat, 2018).

Nevertheless, the TVET sector in Bangladesh is yet to be prioritized and has been facing a number of impediments including, skills shortage, skills-gap, and skills mismatch, that is, the mismatch between the supply of skills and the demand for skills (ADB, 2011, 2015; 2016; Ahmed, 2016; Bangladesh Institute of Development Studies [BIDS], 2017; Dewan & Sarker, 2017; Hossain, 2018; Khan, 2019; Mia & Karim, 2015; Raihan, Lemma, Khondokar, & Ferdous, 2017; World Bank [WB], 2018). The mismatch between the outputs of the TVET system and the needs of the employment sectors involves three dimensions: first, the trades or technologies being offered through training programs are not pertaining to the world of employment; second, the competencies acquired in relation to the requirements of industries or self-employment opportunities are not sufficient; and third, the lack of practical experience of the learners for acquisition of skills (Mia & Karim, 2015). Hence, there is a missing link between skill development and employment, that is, a lack of alignment between TVET and industries in Bangladesh. Several studies have indicated that skills mismatch has negative impacts on the country's economy, especially on labour market and productivity (ILO, 2019; Nikolov, Nikolova, Ganev, & Aleksiev, 2018; Zira, 2016). Nonetheless, the lack of alignment between TVET and industries has not yet been properly spotlighted in research, especially pertaining to Bangladesh context. While there are some studies available in the academia linking TVET with industries, most of which are principally country specific and lack a holistic view (Bagale, 2018; Hadromi, 2018; Jahonga et al., 2016; Lim, 2009; Moses, Muladi, & Wibawa, 2016; Obwoge, Mwangi, & Nyongesa, 2013; Quanquan, 2009; Raihan, 2014; Singh & Tolessa, 2019; Yahya & Yasdin, 2015; Misko, Yufeng, Dayuan, Quanquan, & Zerong, 2005;). Hence, there is a need for undertaking research in order to bridge the gap between TVET and industries in Bangladesh. To address this need, the paper seeks to find out supportive policies that would help linking TVET with industries. In this regard, the paper also aims to propose a suitable approach to TVET that would connect skill development with employment through building collaboration between TVET institutions and industries in Bangladesh.

1.1 TVET in Bangladesh

TVET in Bangladesh is delivered and managed by about 24 ministries and 22 agencies of Bangladesh Government. However, the Directorate of Technical Education, an attached body of the Ministry of Education, and the Bureau of Manpower, Employment and Training, abound body the Ministry of Expatriates' Welfare and Overseas Employment, play an instrumental role in delivering and organizing TVET in Bangladesh (Khan, 2019). Moreover, the Directorate of Textiles, which is under the Ministry of Textiles and Jute, plays a vital role in organizing vocational training and technical education especially in the field of textiles in Bangladesh. Bangladesh Technical Education Board (BTEB), an attached organisation of the Ministry of Education, has authority for the certification of SSC (Voc), HSC (Voc) and Diploma Courses. Vocational education and training programs in Bangladesh offer a variety of TVET courses starting from Secondary Level (Class-IX) to the Diploma Level. Technical Training Centres (TTCs), Technical Schools and Colleges (TSCs), the Polytechnic Institutes, Agricultural Training Institutes, Textile Institutes, Marine Technology Institutes, and so on offer TVET courses in Bangladesh. However, this is to note that besides the TVET institutions managed by the Government, there are about a total of 6000 TVET institutions managed by private initiatives across Bangladesh which are involved in organizing a wide range of vocational training courses including SSC (Voc) and diploma (Bangladesh Bureau of Educational Information and Statistics [BANBEIS], 2019; Khan, 2019).

1.1.1 Directorate of Technical Education (DTE)

The objective of DTE is to generate skilled human resources with the expansion and improvement of technical education in Bangladesh. At present, there are a total of 119 TVET institutions being operated under the management of DTE across Bangladesh. They are delivering TVET courses at three different levels: certificate level, diploma level, and degree level (Directorate of Technical Education [DTE], 2019). Currently, there are 64 TSCs under DTE offering vocational courses at certificate level (secondary and higher secondary levels). There are 47 Polytechnic institutes, one Glass and Ceramic Institute, and one Graphic Art Institute being operated under the supervision of DTE offering four-

year diploma courses in diverse areas of technical education. Moreover, there are four engineering colleges and one technical teachers' training institute under DTE offering different courses in engineering and technical education at undergraduate level. A total of 1265108 (about 1.26 million) students were enrolled from 2018 to 2019 in various courses (from certificate to higher level) in all Govt. TVET institutions managed by DTE in Bangladesh (DTE, 2019).

1.1.2 Bureau of Manpower, Employment and Training (BMET)

The BMET, on the other hand, is entrusted with responsibilities of managing vocational training courses offered by attached various training institutions which primarily focus on generating skilled workforce to secure employment at home and abroad, earn foreign exchange and thereby contributing to the economy of Bangladesh. Presently, there are 64 TTCs located across various districts of Bangladesh offering a number of market-driven short or modular vocational courses alongside SSC (Voc), and there are six Institutes of Marine Technology (IMTs) offering diploma in ship building technology (equivalent to HSC) and diploma in marine technology (equivalent to HSC) alongside diverse trade courses. A total of 681786 (about .681 million) students were enrolled from 2018 to 2019 in different TVET institutions in Bangladesh managed by the BMET in various courses starting from certificate level to diploma level (Bureau of Manpower, Employment and Training [BMET], 2018).

1.2 Bangladesh's TVET System

The TVET of Bangladesh mainly consists of formal TVET and informal TVET. As shown below in Figure 1, formal TVET in Bangladesh starts from class-IX and continues up to class-X at secondary education level which involves SSC (Voc) and Dakhil (Voc).

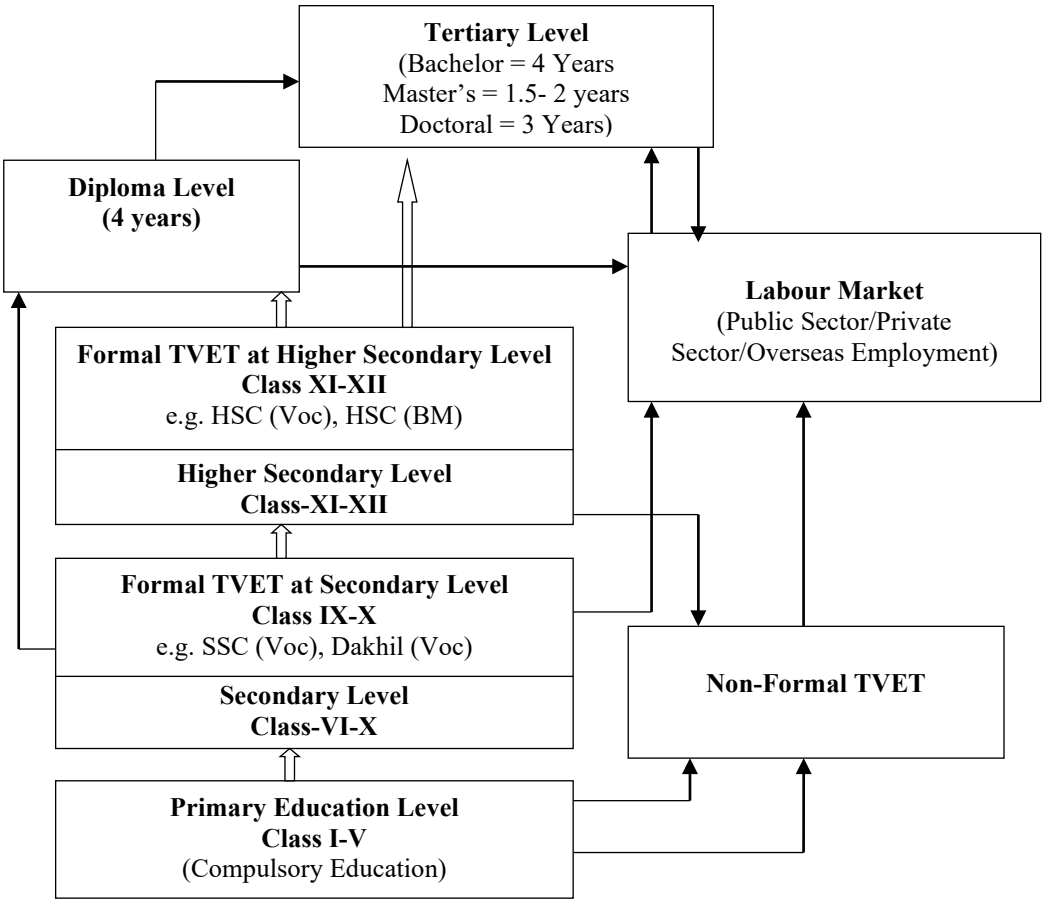

Fig. 1 - TVET system in Bangladesh.

SSC (Voc) is usually offered in different Govt. TSCs and TTCs along with several private technical schools in Bangladesh. HSC (Voc) is offered in different Govt. TSCs while HSC (BM) is conducted in many private business management colleges in Bangladesh (BTEB, 2019). After completing SSC (Voc) and Dakhil (Voc), a student is entitled to pursue HSC (Voc). However, after passing SSC (Voc) or Dakhil (Voc), a student can join labour market or can continue his studies by undertaking either HSC (Voc) or Diploma which is conducted in several public and private

polytechnic institutes, vocational textile institutes, agricultural institutes, and so on. Moreover, after completing HSC (Voc) a student may join labour market without pursuing further formal TVET. A student after completing HSC (Voc) is also eligible to undertake diploma course in certain level. However, after completing diploma, a student is eligible to pursue Bachelor of Engineering course in universities (public or private) or to join labour market. In this way, formal TVET in Bangladesh is connected to secondary education and tertiary education. While formal TVET is basically school-based, it involves industrial attachments for certain period.

Nevertheless, there is no planned or well-structured workplace learning for the students chiefly due to lack of cooperation between industries and TVET institutions in Bangladesh. Like formal ones, non-formal trainings are structured and have organized learning objectives but they are not accredited by BTEB (ADB, 2015). The students with general educational background can also undertake non-formal skill development courses after completing primary or secondary or higher secondary education in order to join labour market in keeping with their needs and market's demands. However, apart from formal and non-formal TVET, informal trainings are also conducted at different levels across Bangladesh. In this regard, this is to note that informal training plays an important role in Bangladesh labour market since an overwhelming majority (85.1%) of the working-age population is engaged in informal employment. Specifically, a total of 51.7 million persons are engaged in such employment, of them 31% were 15-29 years old (BBS, 2018). Hence, a substantial portion of workers engaged in informal sector are young people who gain skills through informal trainings corresponding to their jobs (Khan, 2019).

1.3 Trends of TVET and Labour Underutilization in Bangladesh

1.3.1 Trends in TVET

Table 1 - Trends in TVET (2009-2018).

Year	No. of TVET Institutions	No. of Teachers	No. of Students	No. of Girl Students	% of Girl Students
2009	3290	21523	475848	113078	23.76
2010	2848	22455	447927	102581	22.90
2011	2981	22919	506556	136853	27.02
2012	3327	26332	608170	165474	27.21
2013	3766	27073	645985	182662	28.28
2014	4014	28798	689663	189174	27.43
2015	5790	30903	872658	208874	23.94
2016	5897	32379	875270	209656	23.95
2017	5897	34416	891964	216376	24.26
2018	**6865**	**50931**	**1067484**	**264262**	**24.76**

Source: BANBEIS, (2019). Bangladesh Education Statistics-2018

As shown in Table 1, the numbers of TVET institutions, teachers, students, and girl students increased gradually from 2009 to 2018. In 2009, there were a total of 3290 TVET institutions in Bangladesh where a total of 21523 teachers were engaged, a total of 475848 students were enrolled, of them 23.76% were girls. However, in 2018, there were a total of 6865 TVET institutions in Bangladesh where a total of 50931 teachers were employed, and a total of 1067484 (**1.067 million**) students were enrolled, of whom 24.76% were girls (BANBEIS, 2019).

1.3.2 Trends of TVET Graduates

As can be found below in Table 2, the numbers of both TVET examinees and graduates increased steadily from 2012 to 2018 while the percentage of TVET graduates fluctuated over the period. In 2012, there were a total of 317004 examinees, of them 250456 (.250 million) were graduated representing the graduation rate of 79%. However, in 2018, there were a total of 581185 examinees, of them 456303 (.456 million) were graduated representing the graduation rate of 78.51%.

Table 2 - Trends of TVET examinees and graduates (2012-2018).

Year	No. of Examinees	No. of Graduates	No. of Graduates (in millions)	% of Pass
2012	317004	250456	.250	79.01
2013	352729	281262	.281	79.74
2014	406345	339337	.339	83.51
2015	458530	387186	.387	84.44
2016	489901	396738	.396	80.98

Table 2 - (Continue)

Year	No. of Examinees	No. of Graduates	No. of Graduates (in millions)	% of Pass
2017	536661	437001	.437	81.43
2018	581185	456303	.456	78.51

Source: BTEB (2019). Annual Report 2018-2019

1.3.3 Trends in Labour Underutilization

Table 3 - Labour Underutilization of the Country by Quarter and Sex (2016-2017).

Quarter	Bangladesh ('000)		
	Male	Female	Total
Q1	2861	3638	6498
Q2	3364	3306	6670
Q3	3146	3600	6746
Q4	3108	3279	6387
Year	**3119**	**3456**	**6575**

Source: BBS, (2018). Labour Force Survey (LFS) 2016-17

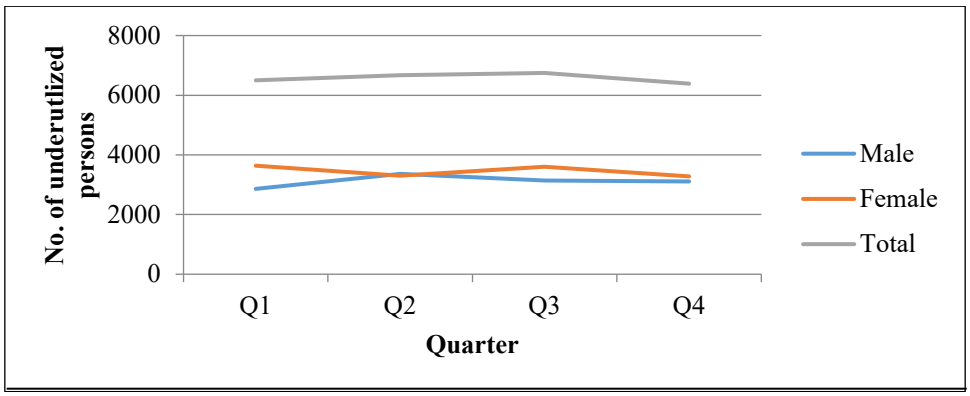

Fig. 2 - Labour Underutilization by quarter and sex.

Underutilization refers to mismatches between labour supply and demand. As shown above in Table 3 and Figure 2, total labour underutilization fluctuated over survey period (2016-2017) with a peak in Q3. However, overall a total of 6.57 million persons were underutilized, of whom 3.11 million were males and 3.45 million were females. As such, females were more underutilized than males (BBS, 2018).

1.4 Models of Collaboration between TVET Institutions and Industries

A number of models of collaboration between TVET institutions and industries (or enterprises) are available in the academia (Government of Western Australia, 2014; Lim, 2009; Pilz, 2016; Solga, Protsch, Ebner, & Brzinsky-Fay, 2014; Quanquan, 2009; Queensland Government, 2019). The models of collaboration between TVET institutions and industries are presented below in Table 4:

Table 4 - Models of Collaboration.

Model of Collaboration	Characteristics	Implementing Country	Benefits
Dual System Model (Pilz, 2016; Solga, et al., 2014)	• Duality between general and vocational education • Vocational schools provide youths with general education with focus on theoretical orientation while industries or firms provide youths with practical knowledge and skills for specific occupations at workplace	Germany, Austria and Switzerland	• The blending of theoretical and practical orientations • Job-specific training • Industry demand-driven training • More connectivity with labour market • A system of apprenticeship • Trainees are more motivated • Joint collaboration • Joint financing • The greater scopes for the graduates to be employed
Mutual Cooperation between Enterprise and School Model (Quanquan, 2009)	• Enterprise seeks to find out a well-established vocational school or training centre that offers relevant vocational trainings for building mutual partnership • The philosophy is to benefit themselves through helping each other • Benefits of industry involve the development of industrial production process and productivity while the benefits of vocational school involve having access to industry's technology, equipment and getting financial support from the industry	China	• Mutual cooperation • Mutual benefits • Shared responsibility • Relevant jobs for the graduates • Linking skill development with industry
Training by Order Model (Quanquan, 2009)	• An agreement for partnership is signed between industry and vocational institution • Industry decides what types of training and skill it requires • Industry provides necessary financial and technical supports and arranges workplace training • Course curriculum and types of training are jointly designed and developed by vocational institution and industry • Training are designed in response to industry demands	China	• Building partnership for mutual cooperation • Curriculum and trainings are designed in line with industry needs • Joint participations in planning and designing curricula and training • Training quality and standards are jointly set

	• Vocational institution participates in the development of technology and products		• Trainees have access to workplace learning • Trainees have a greater scope to be employed • Trainees could avail themselves of incentives • Reducing dependency on Govt. financing

Table 4 - (Continue)

Model of Collaboration	Characteristics	Implementing Country	Benefits
Zero Period Adaptation Model (Quanquan, 2009)	• In collaboration with industry, vocational institution designs training program by identifying skills requirements of the industry and supporting its trainees to receive job specific trainings in advance so that they do not need to undertake any practical orientation soon after they are hired or employed by that industry • Vocational institution makes proper utilization of the enterprise's resources • The system requires reconstructing course and curriculum, updating instructors' skills and other necessary arrangement in keeping with industry needs • Proper integration of theory and practice that meets the needs of both – trainees and industry	China	• Skill development training focuses on industry needs • Linking skill development with employment • The trainees undertake job specific training in advance • Connecting trainees with employer by creating a pathway • The employees do not need time to get adapted to industry • Proper combination theory and practice • Ensures up-to-date trainings
Combined School-Factory Model (Quanquan, 2009)	• With the help of specific expertise and resources, vocational school establishes plant(s) to meet the needs of local economy • Vocational school not only focuses on the development of demand-driven curriculum and training but also concentrates on the development of new technology through research and development • The development of new technology and machine equipment increases the demand for skilled labour • Enables vocational school to make profit out of offering diversified vocational training and meeting the needs of local economy • Graduates are highly valued by the employers	China	• Utilization of vocational school's resources • Focuses on the needs of local economy • Need-based training • High quality of training • Focuses both on teaching and scientific research • Increase the demand for skilled labour • The graduates have greater access to local labour market • High chances for the graduates to be employed • A profitable and

			comprehensive approach
International Cooperation Model (Quanquan, 2009)	• In collaboration with the foreign enterprise, vocational school aims to improve the quality of its training provision of services to the local people • Vocational school tries to capitalize technical expertise and experiences of overseas enterprise • Development of modern training system , methods and course curriculum in association with the	China, Vietnam	• International exchange of knowledge, skills and experiences • Use of modern and up-to-date training system and curriculum in response to local and global needs • High quality

Table 4 - (Continue)

Model of Collaboration	Characteristics	Implementing Country	Benefits
International Cooperation Model (Quanquan, 2009)	overseas enterprise • Focuses on the networking with other reputed domestic enterprises alongside international networking • Greater employability for the graduates		training • Domestic networking along with international networking • Greater acceptability of the graduates for employment
Combined School-Workplace Learning Model (2+1 System) (Lim, 2009)	• The students have to undertake vocational education and training both in school and workplace at higher secondary level • The students have to spend two years at school, and one year in an attached industry for job-specific training as an apprentice • Focuses on both general education and practical orientation with strong focus on job-specific skills • Course curriculum and training methods are jointly planned and designed by school and industry	Korea	• A student could start his vocational career as an apprentice in an enterprise during his high school period • The system could connect the school education with workplace • Focuses on job-specific training • The system could easily link skill development with employment • Provides job-specific training • More suitable for reducing skills gap
Contract-based Training Model (Lim, 2009)	• Focuses on company specified training within technical high schools • Provides the opportunity for supplementary training in technical high school beyond regular school curriculum • Voluntary participation of the trainees • The trainees need to sign a contract with the enterprise to work for reserve worker	Korea	• Industry demand-oriented • Reduces the mismatching of supply of labour and the demand for labour • Connects the trainees with the enterprise • Connects skill development with

	• The enterprise bears the costs for conducting job-specific vocational training		employment
School-based Apprenticeship or Traineeship Model (Government of Western Australia, 2014; Queensland Government, 2019)	• School-based apprenticeship or traineeship is an employment-based training in which an apprentice is a school student who (or his parents) is required to sign a contract with the employer	Australia	• An employment-based training • Course curriculum reflects the combination of school studies, apprenticeship or traineeship

Table 4 - (Continue)

Model of Collaboration	Characteristics	Implementing Country	Benefits
	• The system allows students to undertake on-the job training within an actual workplace as part of their school education • School curriculum reflects the combination of school studies, paid work for the employer, apprenticeship or traineeship occupation • Recognitions of skills		• Gives an opportunity to students to work in actual workplace • Students are paid for their work • Recognition of skills • Links skill development with employment

2. Methodology

2.1 Nature of Study, Participants and Ethical Issues

The study is basically qualitative since it attempts to examine the social reality and present the context pertaining to TVET, in particular, the linkage between TVET and industries in Bangladesh from the viewpoint of the respondents drawing on their personal observations, experiences and shared understandings (Babbie, 2016; Creswell & Creswell, 2018). While the research is principally qualitative, it considers both qualitative and quantitative data to gain a better understanding. All the respondents who participated in this research were Government officials and instructors working in different Government organisations or departments and TVET institutions in Bangladesh associated with TVET policy making, implementation and instructions. They participated in this study voluntarily with no obligations and financial transactions with the researcher. Prior to interviewing process, they were duly informed of the objective of the research. The researcher maintained honesty and sincerity in the course of his research work.

2.2 Sampling and Data Collection

Twelve respondents were selected for this qualitative study on the basis of purposive sampling for the convenience of the researcher. Of them, one was selected from the Ministry of Labour and Employment, one was from the Bureau of Manpower, Employment and Training, one from the Directorate of Technical Education, one from Bangladesh Technical Education Board, one from Bangladesh Institute of Glass and Ceramics, one from Bogra Polytechnic Institute, one from Institute of Marine Technology, Chandpur, one from Institute of Marine Technology, Munshiganj, one from Gazipur Technical School and College, one from Sylhet Technical School and College, and the rest two from Bangladesh-Korea Technical Training Centre, Dhaka. Both primary and secondary sources of data were utilized in keeping with the objective of the research. Primary data were collected through semi-structured interviews with the respondents conducted by the researcher himself from April 16, 2020 to April 29, 2020 over telephone due to nationwide lockdown arising out of the outbreak of COVID-19 in Bangladesh. The interviews with the respondents lasted from 10 to 15 minutes on average. While interviewing, the respondents were probed in order to collect detailed information. In some cases, the respondents were further interviewed in order to make clarifications and gain a deeper understanding of the context. While interviewing, conversations were carefully noted. Secondary data were gathered from various relevant Government's publications, research reports, journal articles, conference papers, research papers, theses, official statistics, and so on.

2.3 Data Analysis

Qualitative data generated from the interviews were analyzed and interpreted through making comparison, understanding underlying themes, linking concepts or themes, finding out the relationship among them (Babbie, 2016; Creswell & Creswell, 2018; Neuman, 2014). Moreover, tables, concept-mapping, and figures were used to interpret the qualitative data. In contrast, quantitative data compiled from secondary sources were analyzed and interpreted by means of descriptive statistics.

3. Findings

Research Question: Do you think that TVET is linked with the industry in Bangladesh? What would you suggest to link TVET with industries in Bangladesh? Please describe in detail.

3.1 Qualitative Interviews

Table 5 - Qualitative Interviews.

Respondent's No.	Designation	Personal Views	Categories of Responses
1	Senior Instructor, BKTTC, Dhaka	"In my opinion, TVET is not properly linked with industry. If we want to link TVET with industry, this is necessary to promote collaboration between industry and TVET institution and develop TVET curriculum jointly with industry in line with its skill requirements. Moreover, proper implantation of National Skills Development Policy-2011 is necessary".	- TVET is not properly linked with industry; -Promote collaboration between industry and TVET institution; - Design curriculum together with industry in line with its skill requirements ; - Implement National Skills Development Policy properly.
2	Director, BMET	"There is a lack of proper alignment between industry and TVET. I think that to link TVET with industry, it is very necessary to focus on workplace learning alongside school studies. Industry's involvement in planning and designing syllabus is also important. Moreover, I must suggest implementing dual system in TVET in Bangladesh".	-Lack of alignment between industry and TVET; -Focus on workplace learning; - Ensure industry's involvement in designing syllabus; - To implement dual system in TVET.
3	Principal, Institute of Marine Technology, Chandpur	"I think that TVET is not adequately linked with industry in Bangladesh. While developing curriculum, industry's participation is necessary so that it could reflect industry's needs. Curriculum should focus on On-the Job Training. Moreover, joint collaboration in carrying out research and organizing seminars and workshops is required".	-TVET is not adequately linked with industry; -Ensure industry's participation in developing curriculum; - Ensure industry's needs-based training; - Focus on On-the Job Training; - Carry out research in collaboration with industry; - Organize seminars and workshops jointly with industry.
4	Chief Instructor, TSC, Gazipur	"Industry is not adequately connected with TVET in Bangladesh. Government has to	- TVET is not adequately linked with industry; -Require Government's

		ensure industry's participation in TVET, especially in designing syllabus and arranging apprenticeship. Training should be updated in response to industry's skill requirements"	efforts; -Ensure industry's participation while designing syllabus; -Arrange apprenticeship; - Update training in response to industry's skill requirements.
5	Chief Instructor, TSC, Sylhet	"Industry is not properly linked with TVET. Industries are reluctant to interact with TVET institutions. It is necessary to promote mutual collaboration which will focus on identifying skills, designing syllabus, and facilitating workplace	- TVET is not properly linked with industry; -Establish mutual collaborative efforts in identifying skills and designing syllabus; - Focus on workplace

Table 5 - (Continue)

Respondent's No.	Designation	Personal Views	Categories of Responses
		learning, joint supervision and monitoring".	learning; - Focus on joint supervision and monitoring.
6	Curriculum Specialist, BTEB	"I think that there is a lack of coordination between TVET and industry. To link TVET with industry, three things are very necessary: a) industry's needs-based curriculum; b) dual system which combines both school studies and workplace learning; and c) inviting engineers, craftsmen and industry people at TVET institutions in seminars and workshops".	- There is a lack of coordination between TVET and industry; -Ensure industry's needs-based curriculum; - Introduce dual TVET system; -Invite engineers, craftsmen, and industry people in seminars and workshops.
7	Senior Instructor, BKTTC, Dhaka	"In Bangladesh, TVET is not properly linked with industry. If we want to link industry with TVET, we need to update syllabus in line with industry's skill requirements, ensure On-the Job Training, implement national skills data base, update instructors' skills in response to changing technology, and organize job fairs and workshop together with industry".	- TVET is not properly linked with industry; -Update syllabus in line with industry's skill requirements; - Ensure On-the Job Training; - Implement national skills database; - Update instructors' skills in response to changing technology; - Organize job fairs and workshops with industry.
8	Assistant Director, DTE	"I think that there is a gap between industry and TVET. To bridge the gap, industry and TVET institutions should work together to ensure needs-based curriculum, promote job-specific trainings. Government should introduce dual training system, implement Competence-Based Training and introduce public employment service".	- There is a gap between TVET and industry; -Work together ; -Ensure needs-based curriculum; -Promote job specific trainings; - Introduce dual system; - Implement Competency-Based Training; - Introduce public employment service.
9	Deputy Secretary,	"In my opinion, industries are not yet	-TVET is not properly linked

	Ministry of Labour and Employment	properly linked with TVET in Bangladesh. However, Government is trying to encourage industry's participation in TVET. To link TVET with industry, it is necessary to design demand-driven training together with industry personnel, focus on On-the Job training, implement National Skills Development Policy-2011, implement national skills data base, and introduce public employment service in Bangladesh".	with industries; -Design demand-driven training together with industry; - Focus on the On-the Job Training; - Implement National Skill Development Policy; - Implement national skills database; - Introduce public employment service.
10	Instructor, Bogra Polytechnic Institute	"I think that TVET is not satisfactorily linked with industries in Bangladesh. To link TVET with industries, this is very necessary to".	-TVET is not satisfactorily linked with industries; -Establish mutual cooperation between TVET

Table 5 - (Continue)

Respondent's No.	Designation	Personal Views	Categories of Responses
		establish mutual cooperation between TVET institutions and industries, update curriculum in accordance with industry's needs, and implement National Skills Development Policy-2011	institution and industry; - Update curriculum in line with industry's needs; - Implement National Skills Development Policy.
10	Instructor, Bogra Polytechnic Institute	"I think that TVET is not satisfactorily linked with industries in Bangladesh. To link TVET with industries, this is very necessary to establish mutual cooperation between TVET institutions and industries, update curriculum in accordance with industry's needs, and implement National Skills Development Policy-2011".	-TVET is not satisfactorily linked with industries; -Establish mutual cooperation between TVET institution and industry; - Update curriculum in line with industry's needs; - Implement National Skills Development Policy.
11	Principal, Bangladesh Institute of Glass and Ceramics, Dhaka	"To me, TVET is not yet linked with industries properly in Bangladesh. To link TVET with industries, I would suggest four important things: a) promote mutual collaboration between industries and TVET institutions; b) design training in response to industry's skill requirements; c) implement Competency-Based Training, and d) introduce public employment service".	-TVET is not yet linked with industries; -Promote mutual collaboration between industry and TVET institution ; -Design training in response to industry's skill requirement; - Implement Competency-Based Training; -Introduce public employment service.
12	Principal, Institute of Marine Technology, Munshiganj	"In my opinion, TVET is not properly linked with industries in Bangladesh. To link TVET with industries, Government should take some proper steps: a) ensure industry's cooperation to facilitate workplace learning; b) update syllabus in response to industry's	-TVET is not properly linked with industries; -Require Government's efforts; - Ensure industry's cooperation to facilitate workplace learning; - Update syllabus in

	demands; and c) implement national skills data base properly".	response to industry's demands; - Implement national skills database.

Source: Fieldwork, April, 2020

Based on the aforesaid interviews, we can understand that TVET has not yet been properly linked with industries in Bangladesh. Thus, in order to examine the context and to find out the ways to link TVET with industries, we have grouped all the derived categories of responses into two key themes: a) mutual collaboration (partnership) between TVET institutions and industries, and supportive public policy which can be depicted as follows:

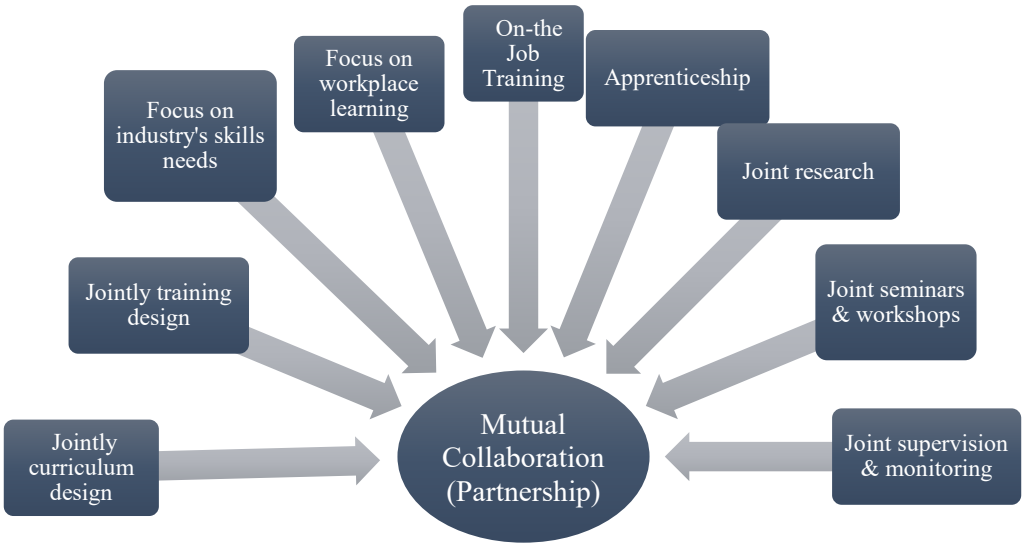

Fig. 3 - Mutual collaboration between TVET institutions and industries.

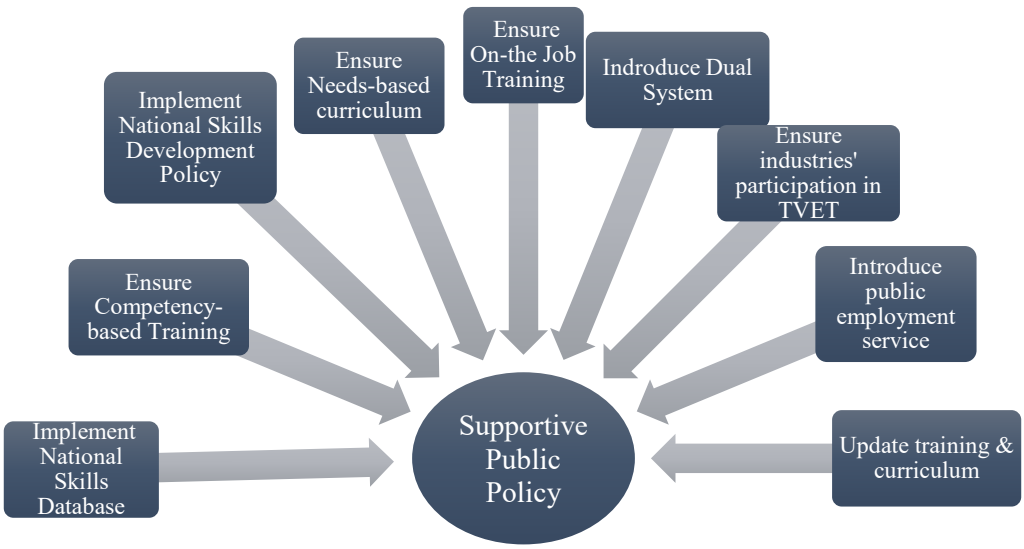

Fig. 4 - Supportive Public Policy.

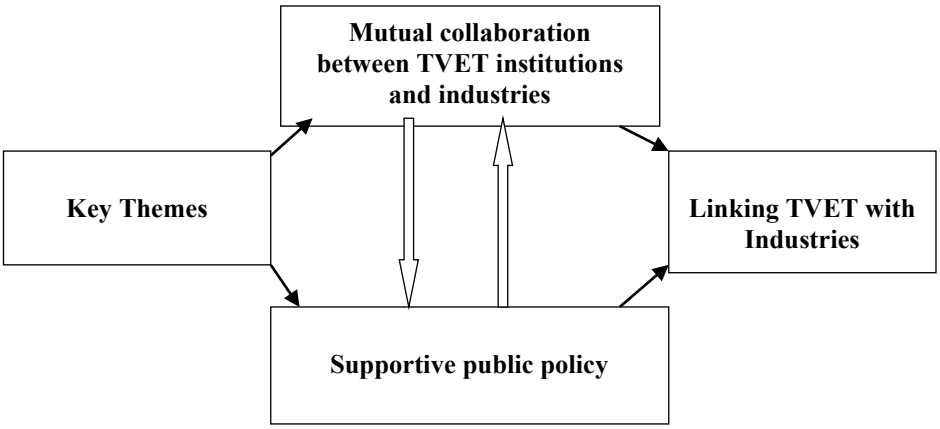

Fig. 5 - Linking TVET with Industries.

Figure 5 shows how mutual collaboration between TVET institutions and industries, and supportive public policy may contribute to linking TVET with industries in Bangladesh. As shown above in Figure 3, mutual collaboration between TVET institutions and industries involves a number of collaborative efforts such as joint participation in designing curriculum and training in line with industry's needs or skill requirements, focusing on workplace learning or On-the Job Training (OJT) or apprenticeship, undertaking joint research, and organizing seminars and workshops jointly, joint supervision and monitoring. These collaborative efforts would benefit both – industry and TVET institution. TVET institution would generate skilled manpower while industry would get skilled workforce in line with its skill requirements and thereby could contribute to matching skills and reducing skills gap. Moreover, both industry and TVET institution would benefit from exchanging their skills and scientific knowledge provided that they jointly carry out research, and organize seminars and workshops on the development of equipment, production process, instructional methods, and skill assessment. As shown above in Figure 4, supportive public policy incorporates several policy issues which require Government's interventions such as ensuring industries' participation in TVET basically in designing curriculum, and training in line with industry's skill requirements, introducing dual system, that is, the combination of school studies and workplace learning, emphasizing OJT, updating training for both instructors and students, and curriculum in response to labour market needs and technological changes, implementing National Skills Development Policy and National Skills Database, and introducing public employment service in Bangladesh, and so on. National Skills Development Policy incorporates two important components: NTVQF and Competency-based Training (CBT) which are linked with labour market needs and skill requirements. On the other hand, National Skills Database provides the available information about the supply of skills and the demand for skills. Supportive public policy would facilitate matching skills and build a favourable condition that could promote mutual collaboration between TVET institutions and industries, and link TVET with industries as well. Moreover, supportive public policy, and mutual collaboration between TVET institutions and industries would influence each other and create an enabling environment that would link TVET with industries in Bangladesh.

3.2 Partnership-based Approach to TVET

Partnership is the relationship between two actors or organisations that have agreed to cooperate and collaborate each other in specified areas on the basis of common goal, mutual understanding, shared responsibility, accountability, joint commitments, and so on (Aidlink, 2010; Bailey& Dolan, n.d; Helmy, 2014; Sandika, Yogyakarta, & Usman, 2017; UNESCO, 2018; World Bank, 1998). As World Bank (1998, p. 5) stated, "partnership is a collaborative relationship between entities to work toward shared objectives through a mutually agreed division of labour". Partnership involves association, cooperation, collaboration, participation, joint decision-making, and long-term relationship (Bailey& Dolan, n.d.). Hence, partnership-based approach to TVET can be defined as the association between an TVET institution and an industry or a firm which have agreed to work together and collaborate each other in certain areas of TVET, especially to link TVET with employment on the basis of some defined principles including common vision, mutual understanding, shared responsibility, mutual benefits, and so on.

Drawing on our empirical findings and available literature in the academia on the collaboration between TVET institutions and industries, we have proposed a partnership-based approach to TVET which is presented below in Fig. 5. Our aim is to apply this approach in Bangladesh in order to link TVET institutions with industries. In Bangladesh, TVET basically has two forms: formal TVET and non-formal TVET. Formal TVET is connected to formal education structure in which a student can start his vocational education at secondary school and go up to doctoral level step by step. However, non-formal TVET usually involves short courses ranging from two weeks to six months, no connection with formal education structure, which basically focus on practice and technical competences rather than theoretical

orientation. As shown below in Fig. 5, we have presented four models of collaboration in the partnership-based approach to TVET in Bangladesh in view of current needs and context, each of which reflects a certain mode of collaboration between industry and TVET institution based on a combined effort or a planned activity. We have proposed two models for formal TVET which are: Combined Learning Model and School-based Apprenticeship or Traineeship Model.

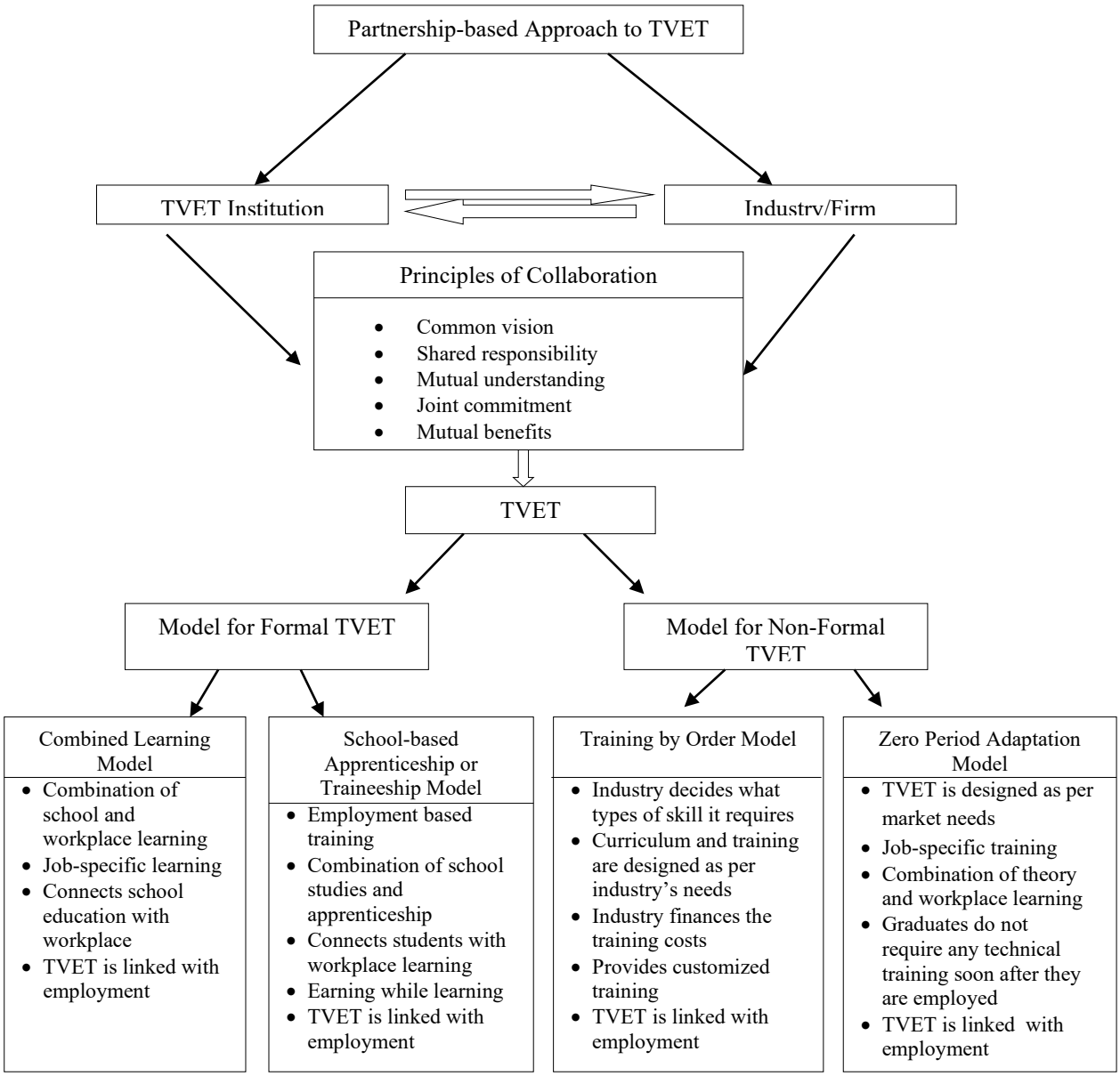

Fig. 6 - Partnership-based approach to TVET

As shown in Figure 6, Combined Learning Model is a customized form of the German Dual System which combines both school and workplace learning systems which we have proposed to execute in secondary level and higher secondary level, especially in SSC (Voc) and HSC (Voc) where a student will pursue full time general education for one and a half years at vocational school or TVET institution and undertake workplace learning or OJT for the rest six months with internship at some industry with which the TVET institution is in partnership. This model is also a modified version of the Korean 2+1 Model (Lim, 2009). The model would help the students to be linked with industry alongside school education. Moreover, the system would allow the students to obtain both certificates – the school certificate and skill certificate as per NTVQF of Bangladesh (Ministry of Education, 2011). In contrast, as discussed earlier, School-based Apprenticeship or Traineeship Model is an Australian employment-based training system which may be implemented at secondary level or higher secondary level in which a student will be required to pursue workplace learning as an apprentice or a traineeship based on a contract with the employer alongside formal education in school. The system would allow the students to undertake OJT at actual workplace as part of their school education.

Moreover, this system not only would allow the students to link themselves with industry but also enable them to earn during apprenticeship (Government of Western Australia, 2014; Queensland Government, 2019).

The next two models have been proposed for non-formal TVET which are Training by Order Model, and Zero Period Adaptation Model. The two models can be proposed for the trainees who have already completed secondary or higher secondary education and are looking for jobs. Under Training by Order Model, vocational training is job-specific, the course of which is designed as per industry's needs or skill requirements. The training costs will be borne by the industry. Upon the successful completion of the training and based on school's recommendation, the trainees are expected to be employed by the industry. In this way, the system would enable the trainees to connect themselves not only with industry but also with employment. Zero Period Adaptation Model, on the other hand, is more comprehensive than the earlier one. The training system is jointly designed by school and industry in response to market needs and combines both theory and work place learning so that it could orient the trainees with necessary skills required for a job. Thus, the model not only would promote mutual cooperation between an industry and a TVET institution but also enable the students to be linked with employment (Quanquan, 2009). Therefore, we have proposed this approach to facilitate public-private partnership to TVET in Bangladesh where public TVET institutions will collaborate with private industries or firms on the basis of common vision, mutual commitment and shared responsibility to design needs-based curriculum and trainings, focus on workplace learning, ensure both students' and instructors' skills in response to labour market needs and technological changes, secure employment for the graduates, and thereby connect skill development programs with employment.

4. Summary and Discussion

The study argues that TVET has not yet been properly linked with industry in Bangladesh. As such, the study has proposed two important policy needs or interventions in order to link TVET with industries in Bangladesh. First, to establish mutual collaboration between industries and TVET institutions which requires undertaking a number of collaborative efforts on the part of both sides that will involve identifying industry's skills requirements, designing curriculum and trainings in response to industry's needs, focusing on workplace learning or OJT or apprenticeship, organizing seminars and workshops, carrying out research on the development of equipment, production process and instructional methods, and so on. Second, supportive public policy that requires several policy issues and Government's interventions including ensuring industries' participation in designing curriculum and trainings, updating curriculum, and training for both instructors and students in response to market needs and technological changes, introducing dual system with strong focus on workplace learning or OJT, implementing National Skills Development Policy and National Skills Database, introducing public employment service in Bangladesh, and so on. In this regard, this is noteworthy that National Skills Development Policy-2011 involves NTVQF and CBT which would promote demand-driven TVET and competencies, and facilitate national and international recognitions of skills (Ministry of Education, 2011; ILO, 2012b). National Skills Database or National Skills Data System would facilitate analyzing data on both – supply of skills and demand for skills and thereby would contribute to matching skills and reducing skills gap (ILO, 2012c). Moreover, public employment service is a Government's mechanism which connects job-seekers with employers, collects and analyzes information on the job market and makes it available to public authorities and employers, and thereby would be helpful to match skills and facilitate labour market adjustments (European Training Foundation [ETF], 2017; ILO, 2015b). As such, the study puts forward that mutual collaboration between industries and TVET institutions, and supportive public policy will create an enabling environment that would link TVET with industries in Bangladesh.

To connect skill development with employment through building mutual collaboration between TVET institutions and industries, the study has proposed a partnership-based approach to TVET in which both industry and TVET institution will work together and cooperate with each other on the basis of some defined principles including mutual commitment and shared responsibility to promote formal TVET and non-formal TVET in Bangladesh. In view of Bangladesh needs and present context, the study has suggested four different models of collaboration such as *Combined Learning Model*, and *School-based Apprenticeship or Traineeship Model*, *Training by Order Model*, and *Zero Period Adaptation Model*. Combined Learning Model, and School-based Apprenticeship or Traineeship Model have been proposed to deal with formal TVET while Training by Order Model, and Zero Period Adaptation Model have been proposed to deal with non-formal TVET under collaborative efforts between industry and TVET institution. These models of collaboration will focus on designing curriculum and training in response to market needs and industry's skills requirements, connecting students with workplace learning, and creating a greater opportunity for students for earning during study and a better scope for graduates for employment, and thereby linking TVET with industries, that is, skill development with employment in Bangladesh. The partnership-based approach to TVET would reduce Government's overall responsibility, and ensure quality, transparency, accountability and efficiency in TVET since it incorporates joint commitment, shared responsibility and joint financing (Lim, 2009; Remington, 2017; Quanquan, 2009).

Misko et al., (2005) indicated several models of collaboration from Australian and Chinese perspectives. While the models are very helpful to link TVET with industry, they require modifications or customizations, if they are applied in Bangladesh context. Lim (2009) and Quanquan (2009) indicated a number of models used to promote collaboration

between TVET institutions and industries from Korean and Chinese perspectives respectively and their models are very useful to link TVET with industries, match skills and create diverse scopes for employment for the graduates. Hence, the study reasonably adopted some of their models with customized forms to link TVET with industries in Bangladesh. Obwoge et al. (2013) stressed the need for building collaboration between TVET institution and industry to link training with market and as such their observation match with the present study's findings. To them, industrial attachments could be a means to bridge the gap while they did not propose any model or an approach to TVET that could link TVET with industries. Raihan (2014) and Singh and Tolessa (2019) suggested that the collaboration between TVET institutions and industries with diverse joint initiatives including industrial attachment, workplace learning, internship and traineeship programs, and curriculum updating is necessary to bridge the gap between supply of skills and demand for skills, in particular, the gap that exists between skill development and employment. Therefore, their studies support the present study while they did not propose any approach to TVET that could meet the needs of Bangladesh.

Jahonga et al., (2016) asserted that the collaborative and linkage programs including industrial attachment and industrial visits can strengthen the relationship between industry and TVET institution, ensure quality training and students' job placements and hence, the partnership between TVET institution and industry is necessary to link skill development with employment. Therefore, the findings of the present study are in line with the findings indicated by Jahonga et al. (2016). However, they did not propose any framework of partnership or approach that could allow TVET to be linked with industry. Moses et al. (2016) and Bagale (2018) recognized the need for building cooperation or linkage between TVET institution and industry in order to bridge the skills gap and make TVET more responsive to labour market needs in their studies. As such, their observations match with the present study's findings. However, they failed to provide a holistic model how the collaboration could be built between TVET institution and industry. Hadromi (2018) found that the partnership based on collaborative efforts between industry and vocational school has improved the technical skills of vocational school's students. As such, the present study's findings may reflect his findings. However, Hadromi (2018) provided a partial explanation of collaborative model. The findings of Cambodia Development Resource Institute [CDRI], (2018) recognized the importance of public-private partnership for promoting work-based learning especially in the form of apprenticeship which is critical for quality TVET and students' occupational and professional competencies required by industry and labour market. Thus, the present findings have been substantiated by CDRI's findings. UNESCO (2018) put forward that there are four types of partnership concerning TVET such as informative, advisory, collaborative and contributory partnerships, and placed contributory partnership in the highest level since it involves assigned tasks, shared responsibilities, joint decision-making and joint-financing. Hence, the partnership-based approach to TVET proposed by the present study reflects the characteristics of contributory partnership.

5. Conclusion

Human capital is a set of knowledge and skills that people gain through education and training. As such, TVET is an integral part of HRD and a tool for economic development. However, there is a missing link between skill development and employment, in particular, a gap between TVET and industries in Bangladesh. To bridge the gap, the study has stressed on building collaboration between TVET institutions and industries, and undertaking and implementing supportive public policy which involves ensuring industries' participation in designing curriculum and training, updating curriculum and training in response to market needs and technological changes, introducing dual system with strong focus on workplace learning or OJT, implementing National Skills Development Policy-2011, National Skills Data System, and so on. Bangladesh has made remarkable progress in recent years in socio-economic development. It is globally recognized as one of the economic success-stories and has become a role model for development in terms of many socio-economic indicators and macro-economic stability. However, its unprecedented success in socio-economic parameters may be overshadowed, if skill development is not properly linked with employment through adopting proper policy and approach. As such, the study has proposed a partnership-based approach to TVET in order to link TVET with industry. The study has argued that Government should employ this approach in the form of public-private partnership in order to reduce its overall responsibility, provide demand-driven training, and ensure quality, transparency, accountability and efficiency in TVET. Moreover, the study has suggested that the Government should formulate employment policy immediately in line with National Skills Development Policy. Despite the study has put forward some key policy implications, it has two important limitations: first, the study employed telephone interviews rather than face to face interviews, hence behaviour and body language could not be observed and interview could not be conducted over a prolonged period of time; and second, the respondents were selected on the basis of purposive sampling, rather than random sampling, hence it might reduce the external validity in research.

Acknowledgement

TVET is one of the important policy issues in Bangladesh. While the TVET has been going through a continuous reformation process, it is yet to be properly linked with industries in Bangladesh. In view of the present situation, we carried out the research project in order to link TVET with industries so that skill development could be linked with

employment in Bangladesh. We express our sincere gratitude to Dr. Rejaul Haq (Additional Secretary) and Mr. Md. Aminur Rahman (Deputy Secretary) of the Ministry of Labour and Employment, the Government of Bangladesh, for their valued information about TVET from policy perspective. We are thankful to Mr. Md. Jahangir Alam (Director) and Mr. Md. Monjurul Islam (Assistant Director) of the Directorate of Technical Education (DTE), Dr. Md. Shakawat Ali (Director) and Mr. Md. Jahangir Alam (Principal, IMT) of the Bureau of Manpower, Employment and Training (BMET) for providing us with invaluable information about the current status and problems of TVET in Bangladesh. Finally, we are thankful to all the participants who were involved in this research project.

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