Chapter 11
Technical and Vocational Education and Training (TVET) in Bangladesh – Systems, Curricula, and Transition Pathways

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Abstract TVET in Bangladesh is gaining recognition as a vital tool for economic development as the country attempts to attain middle income economy status by 2021. The government is taking several measures to improve the quality of TVET and increase the enrolment in TVET programmes. In this descriptive study we focus on the TVET system, curricula, teachers' qualifications, current initiatives to enhance relevance of TVET, promote enrolment and female participation. Data was collected through secondary research, including study/project reports, curricula, brochures and research articles. The study was delimited to formal TVET sector including apprenticeship.

In Bangladesh, the majority of TVET programmes are provided at Diploma and Certificate levels in specialized areas through public/private/Non-Government Organisation (NGO)-run institutions. It is mainly school-based and government regulated, however industry participation in developing training standards and strengthening formal apprenticeship training are currently on the national agenda.

The curricula of Diploma and Certificate level programmes are organised subject-wise. The Diploma curriculum contains 41 % theoretical content and 59 % practical content and the curricula of Secondary School Certificate (SSC) (vocational (Voc))/Higher Secondary Certificate (HSC) (Voc) Certificate courses contain approximately 46 % theoretical content and 54 % practical content, excluding an industrial attachment training period.

Incorporating and building on the school based (traditional) methods of delivering skills, a new system has recently been introduced – the National Skills Development System (NSDS). This includes a new National Technical and Vocational Qualifications Framework (NTVQF), uses a competency-based training

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and assessment (CBT&A) approach and includes Recognition of Prior Learning/ Recognition of Current Learning (RPL/RCL). The training standards for NTVQF qualifications are made up of stand-alone units of competency.

Several initiatives are being taken by the government and donor agencies to increase the enrolment and encourage female participation and gender equity in TVET. The authors suggest studies on the performance of TVET institutions in implementing the curricula and the outcomes of these initiatives.

1 Introduction

TVET plays a crucial role in the economic and social development of a country by providing the labour market with skilled human resources and enhancing the productivity and competitiveness of the workforce.

In this article we describe Bangladesh's TVET system, and the structure of the TVET curricula in the formal TVET sub-sector, answering the following basic questions:

- Which TVET models/systems exist in Bangladesh?
- Who are the TVET providers and who are the people actually delivering skills?

Several empirical research studies on TVET have identified a number of major weaknesses in the traditional method of formal TVET provision. These include: Insufficient TVET teachers with adequate professional preparation in both subject matter including practical skills and teaching methods, and with professional ethics and attitude; weak academic supervision, weak teacher's and institutional accountability; insufficient quality textbooks and lab equipment; (extremely) weak coordination among different levels of education (primary, secondary, tertiary) and also among institutions and teacher-student communication; unsatisfactory level of students' basic competencies at entry-level, unavailability of self-learning facilities at TVET institutions, e.g. Information and Communication Technology (ICT) facilities, improper licensing, and inadequate attention to research, etc. (ADB 2008; Elbushari and Aktaruzzaman 2012; Haolader and Nickolaus 2012; Kashem et al. 2011; Khanam and Shamsuddoha 2003; Rafique 2014; World Bank 2007).

The above mentioned issues/problems have been repeatedly stated in one form or other by some other studies as well. For example, a survey conducted by National Skills Development Council (NSDC 2015) over a period of 2013–2014 sees "a mismatch between the outputs of the TVET system and the needs of the employment sectors". The survey argues that this state of mismatch is due to many factors which include ineffective teaching of practical component of the curriculum since majority of TVET teachers lack pedagogical training and practical skills and have no industrial experience, poorly equipped workshops, and lack of quality learning/teaching materials (NSDC 2015, p. 12). The World Bank (2013) conducted a formal labour market survey and reports:

> Mismatches between the skill requirements of the labour market and the skills available; between the prerequisites for a quality work force and the focus areas of pre-employment education and skill building; between the skills being demanded by students and those that are being sought by the labour market; and between employers' and employees' perceptions of a high-quality, high-skilled, and effective worker. (World Bank 2013, pp. XXVIII-XXX)

The survey also reveals that, employers put huge importance on behavioural/personal skills, such as responsibility, communication, problem solving, and team work, together with domain specific technical/vocational skills. However, according to this report

> both employers and employees have a low opinion of the institutions' training abilities because of yet-to-be-operationalized competency standards set for training and education programs. (Haolader et al. 2015)

Haolader et al. (2015) conducted an empirical research study focusing on learning/teaching materials and teaching practices in classrooms/labs in Polytechnics. The authors also measured polytechnic students' cognitive competences at various levels of Bloom's revised taxonomy of learning objectives. The study finds that the curricular focus is less on Applying level skills and more on theory oriented Remembering level of the cognitive process. The above findings support what the NSDP (MoE 2011) underlined about the current situation of skills development systems in Bangladesh (MoE 2011, p. 3). For example, it states that:

> The existing TVET and skills training system has problems with the quality, relevance and scope of programs delivered (Paragraph 2.10, p. 3). In the current system, there is no nationally consistent approach to quality assurance, with current qualifications not based on standards that align with the occupations or skill levels in industry. (Paragraph 2.9, p. 3)

It also added that:

> The skill development system in Bangladesh faces many challenges and issues, not all of which relate to financing or a lack of resources. Significant improvements can be made by implementing more effective and nationally consistent policies and systems of management and quality control. (Paragraph 2.12)

Given the current national focus on the importance of TVET, an increase in the quality of TVET programmes as well as in the enrolment statistics (from the current approximate 5–20 % in 2020) in TVET programmes are envisaged.

Therefore, in this article we also describe:

- How Bangladesh is attempting to improve the quality of TVET provision and increase the enrolment.

The article consists of five main sections. Section 3 introduces TVET and the factors that influence the system in Bangladesh. Section 4 describes the structure of the system. Section 5 presents the curricula structures of a number of selected TVET programmes/courses. The next section describes initiatives to promote TVET using incentives. Section 7 presents a brief description of the quality improvement initiatives. The article concludes with some suggestions for the improvement of the TVET in Bangladesh.

2 Methodology

This descriptive type of study gathers mainly qualitative data from several sources such as studies/surveys/project reports, homepages of relevant organisations, conferences/workshop papers, journal articles, books, curricula/syllabi, national skills development policy, etc. The findings have been discussed in several informal group meetings for checking its correctness and validity. National and international TVET experts, educators, administrators and other TVET professionals (managers, teachers/trainers) participated in these meetings.

The study primarily focuses on formal TVET at Diploma and Certificate levels. It does not include tertiary/higher education. The curriculum analysis was limited to only Engineering Technology/Trade with examples of Diploma in Engineering (Electronics Technology) and Diploma in Textile. However, throughout this chapter, reference is made to initiatives underway to reform the TVET system in Bangladesh.

3 External Factors Influencing TVET

Education programmes of a country are designed and implemented mainly for meeting the cultural and economic needs including aspiration of the people of the country (Rafique 2014). TVET, which aims to prepare a country's youth and adults for the world of work, is a subset of the whole education programmes. In order to make a realistic decision about the size and type of TVET, several external factors such as population, economy and labour market, among others, are considered to be the determinants and need to be analysed. Below are brief descriptions of these determinants.

3.1 Population Statistics

Bangladesh located in South Asia on the Bay of Bengal, bordered by India and Myanmar, is one of the world's most densely populated countries. It has 158,362 million people living in an area of 144,000 square kilometres, an area approximately equal to the size of Bavaria (Bayern 70,547 square kilometres, 12.0 millions) plus twice the size of Baden-Württemberg (35,751 square kilometres, 10.74 millions). The population is relatively young, with the 15–24 age group comprising 18.18 %, while 5 % are 65 or older. (BBS 2015). Figure 11.1 show population growth trends and population changes spawn in Bangladesh.

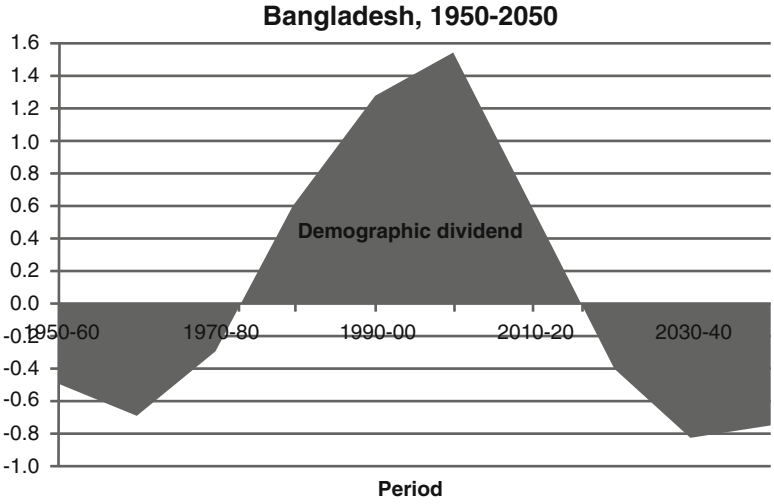

Fig. 11.1 Population changes spawn a demographic dividend for Bangladesh (Source: Navaneetham and Dharmalingam (2012). With permission of Springer)

3.2 Economy and Labour Market

Bangladesh was a success story in promoting employment for its growing population. Taking advantage of their abundance of relatively low-skilled labour, Bangladesh engaged in world markets through light manufacturing, which created wage employment in large numbers, while providing opportunities for rural migrants. The expansion of the light manufacturing sector has allowed for the integration of young women to the labour market. Agricultural modernization, labour migration, and social policies changed the jobs landscape of the country.

It is becoming obvious now however that these changes have not generated a major formalization overall and the amount of formal jobs has not increased a lot, on a national scale, over the past decade. Concerns are also emerging about increasing skills and productivity and moving, as a country, up the manufacturing ladder. The job market does not have sufficient demand for skilled or semi-skilled labour, which is posing problems for employment generation.

According to the World Development Indicators, 28 % of Bangladesh's population were residing in urban areas in 2010, which is considerably lower than the world average of approximately 50 %. Bangladesh is well on the path of rapid urbanization, however, which is already having significant impacts on its economy and the labour market. Employment and economic activities are becoming significantly more focused on urban areas. Bangladesh's urbanization is not widespread however; rather it has been confined to a few cities so far, mainly the capital city of Dhaka. This could be attributed to a highly centralized development approach, where local governments and councils do not carry out development activities.

A tracer study of the World Bank (2006, p. 29) revealed that the expansion of the VET system has not resulted in considerable improvement in labour market outcomes for its graduates. Only approximately 9 % of the participants claimed to be employed, while 47 % of them were unemployed. Approximately 45 % of respondents reported that they were pursuing additional education at various levels higher than their VET qualification.

3.3 Value of TVET in the Labour Market

Bangladesh has only limited natural resources, however, it does have significant potential in terms of human resources. In a report on Technical Education in Bangladesh, Oxtoby (1997) commented:

> (...) perhaps more than any other country, Bangladesh has only human resources on which to base its future development.

The labour market worldwide is becoming globalised (Ray et al. 2007, p. 15). Bangladesh is currently working to diversify its own economy and work opportunities, with a priority on industrial development, but its citizens are also increasingly seeking work in other countries. The economy is largely dependent on foreign remittances, which now come in just after ready-made garment exports in terms of contribution to Gross Domestic Product (GDP).

TVET could become a powerful tool for turning Bangladesh's population into a workforce that could meet the needs of both national and international labour markets. As the demand for skilled manpower in international job markets continues to grow, TVET also presents a way for Bangladesh to increase foreign exchange earnings by exporting skilled manpower.

The government realizes the potential for employment for its citizens nationally and internationally as well as for TVET's potential role in increasing foreign remittances and has expressed in its new education policy that:

> In an era characterized by the challenge of rapid technological change, globalization, economic uncertainty and diminishing resources, there is no alternative to education and training that complies with modern and international standards. Therefore, TVET has been assigned high priority in its National Education Policy – 2009. (MoE 2009)

4 The TVET System

TVET is provided through a variety of different methods and by a variety of different parties in Bangladesh. The system is mostly regulated by government, particularly in terms of formal TVET programmes. Some programmes rely on a traditional approach; other approaches are increasingly more responsive to market needs. Formal TVET is mainly provided through publicly funded TVET institutions,

however, private provision is also becoming popular. This is not dissimilar to the situation in other sectors in Bangladesh, such as health care and tertiary education, which are also seeing a rise in private providers.

TVET is primarily delivered in schools in Bangladesh. Some skills based training institutions and companies also provide non-formal and competency based training and assessment services. Apprenticeships, a combination of both school based and company based training, also exist and are currently being given priority by the present government. In other cases, TVET is handled entirely by crafts persons and their corporations/associations. This method is particularly common in the so-called informal sector of the economy.

Bangladesh's TVET system is rapidly changing and diversifying. The new NSDS, established through the Bangladesh National Skills Development Policy (MoE 2011), recognized problems with the quality of graduates and with the relevance of their skills (NSQAS 2012, p. 6). The new system is created to be more flexible, accessible, responsive to market demand, and offering higher quality programmes. The elements of this system are summarised in a recent publication entitled: Bangladesh NSDS – 2015 (NSDS 2015). In line with the reform goals, the government currently, together with international donors/agencies, is taking special initiative(s) to build the capacity of Bangladesh TVET professionals.

Starting in 2008, the Government's TVET reform project supported by the EU and the ILO conducted numerous studies needed to design the reform agenda (EU 2015). However, there is still significant work to be done to fully implement and upscale the new system. One specific area needing attention now is renewed quality research into TVET status in Bangladesh by specialised experts.

4.1 Pathways for National TVET System

The education system in Bangladesh is split into different streams and levels. Students enter into the system at the primary level, which ends at Grade V. Following this, they enter the secondary level (equivalent to International Standard Classification of Education (ISCED) two to three), which includes the Junior School Certificate (Grade VIII) and the SSC (Grade X) and ends at Grade XII.

There are a number of ways in which school students can enter TVET. At Junior School Certificate level, students can choose to go into the vocational stream and stay for two years at a Secondary Vocational School, which gives them the opportunity to eventually graduate with a SSC (Vocational). Students can also stay in the general education stream and at SSC level, they can go to a technical institution to pursue a Diploma qualification. They can also complete their (higher) education up to Grade XII or beyond and at that post-secondary level, an individual can go to a tertiary education institution to study for an advanced degree or a training institution to obtain a diploma. Moving to the technical/vocational education stream is entirely voluntary. The education structure and pathways for the various education and training streams are shown in the diagram in Fig. 11.2.

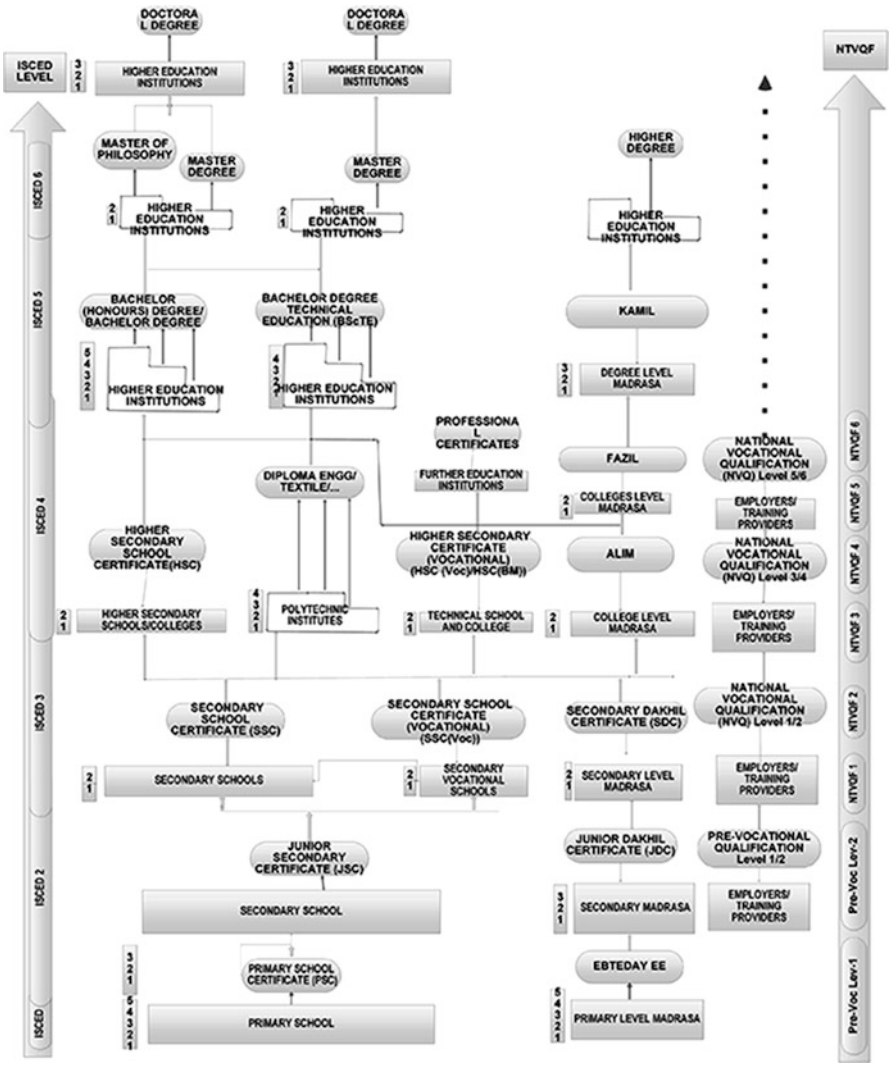

Fig. 11.2 Education Structure of Bangladesh (Source: author's own drawing with reference to Bangladesh Bureau of Educational Information and Statistics (BANBEIS) http://www.banbeis.gov.bd/es_bd.htm)

Prior to the adoption of the National Skills Development Policy, persons who did not have Grade 8 level education could not access formal TVET. Entry requirements under the NTVQF are more flexible focusing on literacy/numeracy skills needed for the occupation for which training is provided.

Note the entry points are for: (i) Under-privileged groups, (ii) Low-educated groups (iii), Year eight entry (iv), Apprentice entry. At every entry point of NTVQF level qualification, persons/workers without qualifications are offered NTVQF

qualification through RPL/RCL, an approach introduced by the TVET Reform Project (ILO 2009; MoE 2011).

4.2 Government-Regulated TVET Provision

Government-regulated TVET programmes are offered both at Certificate and Diploma level.

Certificate level courses provide basic skills and focus mainly on manual skills. They are offered both in schools and workplaces. Students who complete Grade VIII may take the Two-Year SSC level in Vocational Education, SSC (Voc), which covers a similar set of basic skills. Students can then proceed beyond the SSC (Voc) to the Two-Year HSC (Voc), requiring an additional two years of secondary schooling after Grade X.

At the upper secondary non-tertiary level, three-year and four-year diploma-level courses are offered through polytechnic and mono-technic institutions (such as Bangladesh Institute of Glass and Ceramics, Graphic Arts Institute and Bangladesh Survey Institute). The qualifications at these levels (either Diploma or Certificate) are awarded based on student inputs (traditional course/subject based curricula), the duration of the programme/course (in number of years/months) and students' performance in exams/classrooms/labs. Students are assessed through continuous (formative) assessments and final exams (summative assessments). The administration of exams differs slightly between government and private TVET institutions in terms of seating arrangements. Exam candidates of government institutions sit in their own institutions for (semester) final exams, whereas for private institutions they must sit in a nearby public or private institution.

In addition to the traditional pathways to qualification detailed above, the new NSDS, introduced through the National Skills Development Policy – 2011 (MoE 2011), and passed by the Cabinet in 2012, also includes a variety of new methods to attain skills.

The system introduces the NTVQF and uses a CBT&A approach. CBT&A methodology is outcome-based, which differs from traditional input-based approaches.

The NTVQF describes a set of qualifications from Level 1 (Basic Worker) to Level 6 (Diploma level) (Table 11.1). It also has two Pre-Vocational levels that provide a pathway into TVET for those without Grade 8 education.

Under the National Skills Development Policy (2011), all formal TVET qualifications in Bangladesh are aligned to the NTVQF. For example, a Diploma in Engineering is equivalent to National Technical and Vocational Qualifications (NTVQ) Level 6 (MoE 2011, p.16).

The Pre-Vocational levels are rather unique and used in Bangladesh to provide an entry point for those who do not have adequate literacy and numeracy skills.

Table 11.1 National technical and vocational education framework in Bangladesh

NTVQ Flevels	Pre Vocational education	Vocational education	Technical education	Job classification
NTVQF 6			Diploma In engineering or equivalent	Middle level manager/ sub assistant Engr. etc.
NTVQF 5		National Skill Certificate 5(NSC 5)		Highly skilled worker/ supervisor
NTVQF 4		National Skill Certificate 4(NSC 4)		Skilled worker
NTVQF 3		National Skill Certificate 3(NSC 3)		Semi-skilled worker
NTVQF 2		National Skill Certificate 2(NSC 2)		Basic skilled worker
NTVQF 1		National Skill Certificate 1(NSC 1)		Basic worker
Pre-Voc 2	National Pre Vocational Certificate 2			Pre vocation trainee
Pre-Voc 1	National Pre Vocational Certificate 1			Pre vocation trainee

Source: author's own compilation based on MoE 2011

The following Sub-Sections describe the Governance of TVET, Access to TVET and Progression Opportunities, Target Groups, Typical Programmes, Providers, TVET Teachers, etc.

4.2.1 Governance of TVET

Governance of TVET in Bangladesh rests with the Government of Bangladesh. Formal TVET is regulated by a number of different regulatory bodies under different government ministries. According to research, it is offered under and regulated by more than twenty government ministries (Islam 2008, p. 13; Shears 2012, p. 8).

To oversee the activities of public and private TVET providers, the NSDC was re-established in 2008. This apex approval authority on skills development in Bangladesh, headed by the Prime Minister, provides leadership and sets government priorities. The NSDC is supported by a Secretariat and an Executive Committee (ECNSDC). The ECNSDC is co-chaired by a private sector representative, and the Secretaries of the Ministry of Education and Ministry of Labour. Members of the ECNSDC include representatives of relevant ministries and industry representatives (NSDC 2015).

Direct responsibility for overseeing the TVET system rests with two agencies: the Directorate of Technical Education (DTE) and the Bangladesh Technical Education Board (BTEB).

DTE is a government agency concerned with the human resource development of the country and is responsible for setting the overall policy framework of the entire TVET system, the overall administration and supervision of TVET institutions under the Ministry of Education, and interaction and coordination with industries, other government departments, national level institutions, and development partners (DTE 2015).

BTEB, a statutory agency, works under the supervision of Ministry of Education. It is responsible for maintaining the qualification framework and quality of TVET, recognition and registration of various types of TVET institutions, renewal of registration, accreditation of courses, student registration, setting training standards (and relevance to the labour market), student assessment, certification of results, and accreditation of TVET institutions, both government and non-government institutions (World Bank 2006, p. 11). BTEB conducts approximately 76 different course examinations involving approximately 51 curricula covering 6,300 public and private institutions (Talukder 2014).

Public TVET institutions have traditionally always been governed and monitored centrally, however this is set to change with the establishment of divisional/district level monitoring cells. More about TVET Governance structure can be found in Rafique (2014).

Although formal TVET programmes require accreditation by BTEB, any institution (public, private, or NGO-run) may offer training programmes and issue their own certificates. For example, the Bureau of Manpower Employment and Training (BMET), an attached department under the Ministry of Expatriates' Welfare and Overseas Employment, provides vocational skills development training programmes through its own Technical Training Centres (TTCs) and Institutions for Marine Technology and Shipbuilding. BMET also conducts school-based short training and apprenticeship training and awards its own certificates in all of its courses. These institutions also offer BTEB accredited formal vocational education and training courses for which qualifications are awarded by BTEB. Thus, the formal TVET courses at these institutions are under the control of BTEB. BMET oversees these regionally located training centres and institutions, among other functions (BMET 2014, p. 3). Similarly, the Department of Youth Development, Department of Textiles and other departments administer and hold responsibility for the inspection of TVET institutions under their concerned ministries.

The main argument for introducing the NTVQF is to have a framework and qualifications that are common among all sectors in Bangladesh and available to everyone involved in skills development. The country requires a framework that is not only used and recognized by stakeholders in Bangladesh but also by employers and accreditation bodies abroad.

In the formal sector, heads of TVET institutions (principals/directors) have always had limited autonomy. For example, TVET institution managers could hire part-time qualified (teaching) staff only; concerned higher authorities recruited

full-time teachers. Very recently however, steps towards changing these arrangements started to take place. Under a new arrangement, the Ministry of Education granted 64 Technical Schools and Colleges (TSCs) more independence in financial management. TSCs will now be able to provide contract training in response to local industry demand and generate finance for their own use; for example, to buy materials and supplies for regular programmes. Financial decentralization is part of the reform of Bangladesh's skills development system that is currently being undertaken by the Government of Bangladesh through the National Skills Development Policy and assisted by funding from the EU, Canada and other donors including the Swiss Development Corporation (ILO 2015).

4.2.2 Access to TVET and Progression Opportunities

In general, education providers and awarding organisations retain the right to set the entry requirements to individual educational programmes/qualifications so there is no automatic right to progress from one level to the next within the same or different track(s) of education and training. Possibility for transferring credit between qualifications is rare, and, if so, credit is only accepted at education providers' discretion and in line with awarding organisations' RPL guidelines.

For example, polytechnic graduates with Diploma Engineering Qualification can have access to some selected universities for Bachelor level program with exemption of some credits. Students with HSC (Vocational) qualification usually have access to Higher Educational Institutions for pursuing academic education provided they fulfil the entry requirements of individual universities.

Specially designed solely skills-oriented (one year/two years long) trade/training courses exist, offered by NGO/private run TVET providers, however, graduates with these qualifications usually do not have access to formal (higher level) education unless they progress through the NTVQF with Recognition of Prior/Current Learning (RPL/RCL).

4.2.3 TVET Provision to Target Groups, Typical Programmes and Providers

TVET is available at different levels ranging from introductory technical and/or vocational courses in secondary level TSCs to programmes at polytechnic and higher education levels. It can be found in the form of school-based programmes that combine general education with vocational elements, broad technical and vocational programmes and specialist occupational programmes that take place usually in school settings. TVET is usually offered on a full-time basis, however, part-time or evening trade programmes are offered by some TVET providers. Students typically attend courses on a block-release or day-release basis from employers or through evening or weekend training courses.

A wide variety of TVET programmes exist. The majority of them are delivered using the traditional subject based, time bound approach. Recently however,

programmes using a CBT&A approach have commenced, as part of the new NSDS (MoE 2011, pp. 18–19; EU 2015). The methodology is only currently being using in a small number of vocational training programmes in priority economic sectors, and qualifications are awarded at NTVQ Level 1 and 2 only. Some competency standards (curricula) of NTVQ Level 3 and above are already developed but technical training at higher levels is yet to start.

TVET is delivered primarily through polytechnic institutes, TSCs, institutions of science and technology and TTCs. The majority of institutions are privately run, with a small percentage being publicly run and an even smaller percentage run by NGO/not-for-profit organizations. See Table 11.2 below for indicative numbers.

Although institutions under private management make the predominant share of the TVET provisions, they are often marked with weaker performance compared to those under public or NGO management (NSDC 2015). Weaknesses are due in part to relative lack of equipment and qualified, work experienced instructors.

In addition to the existing institutions, both the BMET and the DTE are planning to build more than 250 new institutions (TSCs, TTCs and Polytechnics) over the next few years.

4.2.4 TVET Teachers and Trainers

TVET teachers and trainers are responsible for education and training delivery, student assessment and guidance and counselling of students. Different qualification requirements exist at different types of TVET institutions. Public level national exams for licensing and registration are not in place for the recruitment of teachers of TVET institutions in Bangladesh. Teachers for regular posts in government-run TVET institutions are usually recruited through a recruitment test conducted by a government recruitment agency or authorized selection committee. Prospective teachers must possess at least a Diploma level qualification in the relevant field to be a teacher at a public secondary vocational school, TSC, TTC, or polytechnic. An additional Diploma in Technical/Vocational Education (Diploma TechEd/Diploma VocEd) qualification is usually preferred. Although relevant industrial experience is

Table 11.2 Indicative numbers of TVET institutions

Sample of government TVET institutions	Sample of private training institutions
Polytechnic Institutes: 51	Polytechnic Institutes: 374
Technical School & College: 65	HSC (Business Management) Institutes: 1449
Technical Training Centre: 38	Secondary (Vocational) Schools: 1831
Textile Institutes: 6	Textile Institutes: 72
Agriculture Institutes: 13	Agricultural Institutes: 121
Forestry Institutes: 1	Institutes of Medical Technology: 163
Marine Institutes: 1	Trade courses: 1002
Textile Vocational Institutes: 40	
TOTAL: 212	TOTAL: 4870

Source: author's own compilation based on Shears 2012, p. 8

not a compulsory requirement for TVET teachers, a bachelor level qualification in the relevant field is desirable.

For teaching using a CBT&A approach at any NTVQ level, a teacher must have the same or one level higher NTVQ technical qualification, the Certificate IV in CBT&A, and at least one year industrial experience. Teaching qualifications such as a Diploma TechEd/VocEd, BSc TechEd/MSc TechEd, or NTVQ technical/teaching qualification are available from higher education institutions or from technical and vocational teacher training colleges in Bangladesh. Short-term teacher training also typically takes place in-house, and in the concerned government department. Individuals delivering courses at polytechnics, TSCs, TTCs or similar TVET institutions are generally referred to as instructors and individuals delivering work-based learning are called trainers.

4.3 Other Forms of Training

Apart from government regulated technical and vocational education, companies/enterprises also take responsibility for providing TVET for their workforces. This training is generally delivered through informal or apprenticeship type approaches. The type of training provided varies greatly, from induction training, to health and safety refreshers to technical, job-specific skills training.

4.3.1 Training Providers, Programmes, and Target Groups

A diverse range of organisations provide non-formal, informal or apprenticeship training in Bangladesh, including public and private enterprises, NGOs and not-for-profit organisations, some social-welfare organizations, health and care services, professional education and registration bodies and trade unions. Comprehensive information on all the companies that deliver training and the size and scope of their operations is not available. Several NGOs, not-for-profit organisations, and social-welfare organizations offer skills training to typical target groups such as youth, the underprivileged, and the rural population. This primarily consists of short-term skills development (three to six months duration) in income generating activities. Tailoring/sewing, embroidery, electronics are often offered to women and electrical, radio/television, mobile phone and motorbike repairing, and carpentry is offered to men. Industry bodies also provide training according to the needs of relevant industries and companies.

Many enterprises in the informal and formal economy are considerable providers of basic skilled, semi-skilled and skilled workers through on-the-job training. The scale of on-the-job training for new workers is significant. In some industries the figure is 20–30 % of workers at any given time (Islam 2008, p. 13, with reference to Rahman et al. 2008). Employers prefer recruiting apprentices and helpers who develop skills through work rather than formal training, and workers typically also

prefer to learn a trade while working because of the immediate earning and employment opportunity (Islam 2008, p. 13).

Some of the organizations providing highly specialized short and long training courses for variety of target groups are: Bangladesh Rural Advancement Committee (BRAC), Centre of Excellence Agro Food Skills Foundation (CEAFS), Chittagong Skills Development Centre, Centre of Excellence for Leather Skill Bangladesh Limited (COEL), Centre for the Rehabilitation of the Paralysed (CRP), Dhaka Ahsania Mission (DAM), Grameen, Mirpur Agricultural Workshop and Training School (MAWTS), Muslim Aid Bangladesh, Underprivileged Children's Educational Programs (UCEP)-Bangladesh and Help The Needy.

4.3.2 Apprenticeship Training

Though the current Labour Law provides clear direction for implementing apprenticeships, the annual registration of apprentices did not exceed 100 until 2008 and employers as yet have not adopted the formal apprenticeship training as part of the TVET system (Cordier et al. 2012). The government is currently endeavouring to increase the acceptance of apprenticeships through introducing various incentives, including financial benefits. The vast amount of skills training that takes place informally by employers in the formal as well as in the informal sectors indicates a high demand for skills based training, both from trainees and employers (Cordier et al. 2012).

To address this demand, the government is undertaking a number of efforts to extend apprenticeship training for potential trainees, particularly for those who strive to enter blue-collar occupations but cannot enter the formal TVET system because of procedural restrictions. However, new apprenticeship rules and strategies such as RPL are allowing more persons to become apprentices.

Currently, 9,500 apprentices from 50 companies have been registered under BMET and 1400 apprentices have been registered from 500 informal enterprises throughout the country (DeSilva and Ahsan 2015). Based on recent pilot initiatives of the GOB/EU/ILO TVET Reform Project and a consensus of major stakeholders, the existing apprenticeship system is to be modified. Considering the market demand which requires flexible approaches in contents and duration of apprenticeships (Cordier et al. 2012), proposed new concepts of skills training including dual system in Bangladesh with the following characteristics will be trialled (Table 11.3).

There has been some progress in promotion of apprenticeship training during the past few years, but expansion to national scale has not yet been achieved.

The TVET Reform Project and Bangladesh Skills for Employment and Productivity (B-SEP) Project are currently assisting the Government of Bangladesh through NSDC Secretariat to develop an "Apprenticeship Strategy for Bangladesh" (DeSilva and Ahsan 2015). Apprenticeship training using the dual system has not yet been declared a national priority.

Table 11.3 Characteristics of the new dual system training scheme

Objectives	To increase the supply of skilled workers in occupations as defined by companies and the respective industry sector
	To strengthen and expand the existing apprenticeship training paradigm in Bangladesh
Target groups	Girls and boys, including apprentices from the informal apprenticeship
	Minimum age 14 years
Sectors	All sectors of the economy
Size of firms	No restrictions for size of firms proposed
Duration	From six months to two years corresponding to NTVQF levels 1–4

Source: author's own compilation based on Cordier et al. 2012, p. 3

5 TVET Curricula

As mentioned earlier in Sect. 4.2., TVET in Bangladesh operates at Certificate (secondary) and Diploma (higher secondary) level. It is offered in a range of technical specialties, including agriculture, business, building and construction technology, clothing and textiles, electrical, electronics, computer, information and communication technology, food and nutrition and mechanical and automobile servicing. A complete list of occupations can be seen on the BTEB website. In the following sub-sections, the curricula of some selected programmes will be discussed in brief.

5.1 Diploma Level Curricula

The Diploma qualification corresponds to Bangladesh NTVQ Level 6 (MoE 2011) and can be referenced to the Upper Secondary Technical/Vocational Level 3B or to 4B qualification with provision of direct access to job market and to tertiary level of higher education (UNESCO 2011). Students who acquire SSC or equivalent qualification with minimum of 10 years of schooling (ISCED Level 2) can enrol for this *Diploma* programme. The duration of Diploma level programmes in initial TVET system varies from two to four years.

BTEB offers Diploma-level education and training programmes in several fields including Engineering, Textiles, Health, Agriculture, Fisheries, and Forestry. The Diploma in Engineering is one of the most popular programmes in Bangladesh and the demand for the Diploma in Textile Engineering is also rising (BTEB 2014). The curriculum structure of the Diploma in Engineering (Electronics Technology) and Diploma in Textile Engineering is discussed below.

Both programmes are four years long, divided into eight semesters, including one semester of Industrial Attachment Training. The curricula of these study programmes are organized based on the subjects they contain. Each subject has been allocated credits and contact hours. The total number of credit hours is 162 for each of the programmes. Subjects can be grouped into different categories, such as (1)

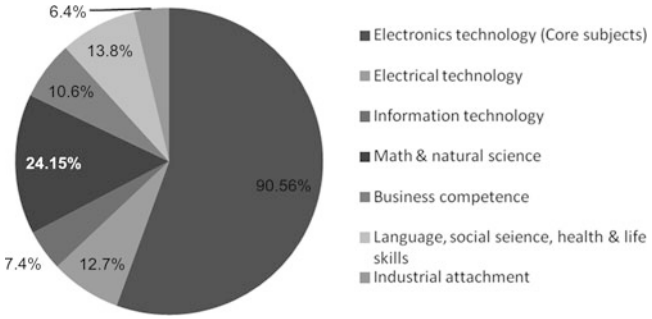

Fig. 11.3 Categories of subjects/distribution of credit hours in the diploma in engineering (Electronics technology) curriculum (Source: author's own compilation based on BTEB (2015) Syllabus)

Domain specific (i.e. electronics related core subjects), (2) Cross occupational (i.e. Electrical Technology, and Information Technology, (3) Mathematics and Natural Science, (4) Business Competence (Business organization and communication, Book keeping and accounting, industrial management, environmental management, and entrepreneurship), (5) Language, Social Science, Health & Life Skills, and (6) Industrial training.

In general, most of the subjects consist of two parts: Theoretical and practical part. The theoretical part is taught in classrooms and the practical part involving tasks/assignments are conducted in laboratories/workshops. The credit hour and contact hour distribution of both programmes are shown in Figs. 11.3, 11.4, 11.5 and 11.6. As seen in Fig. 11.3 for Electronics Technology, 56 % of the total credits are allocated to the domain specific subjects (core Electronics Technology subjects), 11 % for cross occupational subjects, 15 % for Math & Natural Science, 6 % for business related subjects, 8 % for humanities subjects, and 4 % for Industrial Training. Comparing credit and contact hour distributions in Figs. 11.3 and 11.4, respectively, with those in Figs. 11.5 and 11.6, it is visible that both programmes have similar credit/contact hour distribution patterns in their curricula.

On the basis of 16 working weeks per semester, the sum of the contact-hours allocated for the four-Year Diploma in Engineering (Electronics Technology) programme was calculated at 4,080 (excluding Industrial Attachment period). One contact hour is usually 50 min. The bar diagrams in Figs. 11.5 and 11.6 show the distribution of contact hours in different subject categories of the Diploma in Engineering (Electronics Technology) and the Diploma in Textile Engineering programmes, respectively. Each pair of bars in a subject category represents theoretical contact hours and practical contact hours. The contact hours for the industrial attachment training are not shown in these diagrams.

Among the total 4,080 contact-hours, the theory and practical proportions are 1,680 and 2,400, i.e. 41 % and 59 %.

The industrial attachment (internship) training is held in the last (8th) semester. It is 16 weeks long and has two phases, in the first phase students are placed to

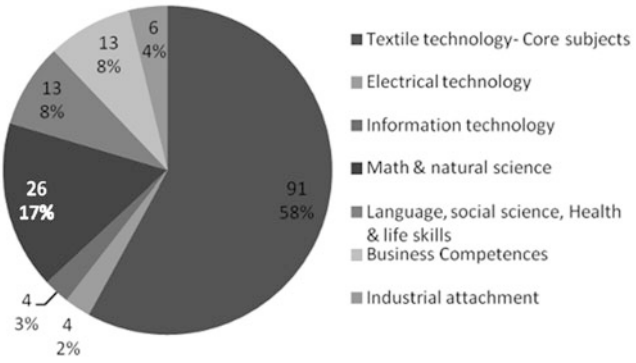

Fig. 11.4 Categories of subjects/distribution of credit hours in the diploma in textile technology curriculum (Source: author's own compilation based on BTEB (2015) Syllabus)

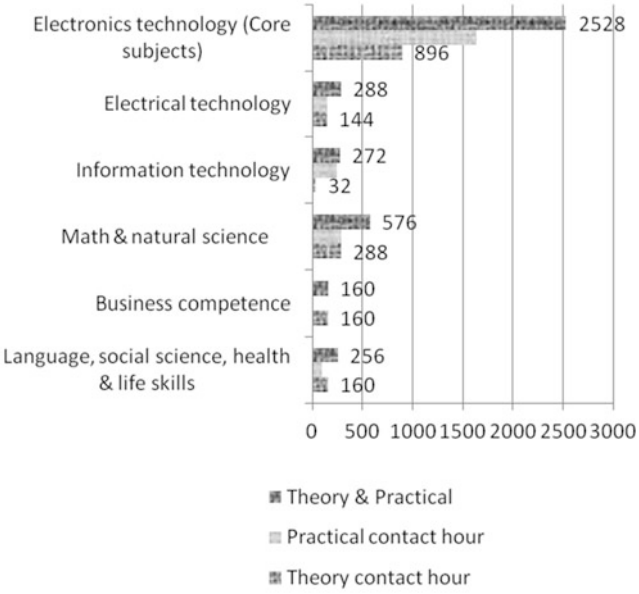

Fig. 11.5 Categories of subjects/distribution of contact hours in the diploma in engineering (Electronics technology) curriculum (Source: author's own compilation from BTEB (2015) Syllabus)

industry/enterprise for 12 weeks. After completing this phase of industrial training they report to their institutes and in the second phase the training is held in their own institution's labs for four weeks. In reality it has been found through interview with some students that the attachment period is not utilised effectively for practical oriented learning rather during this attachment time mostly theory is taught.

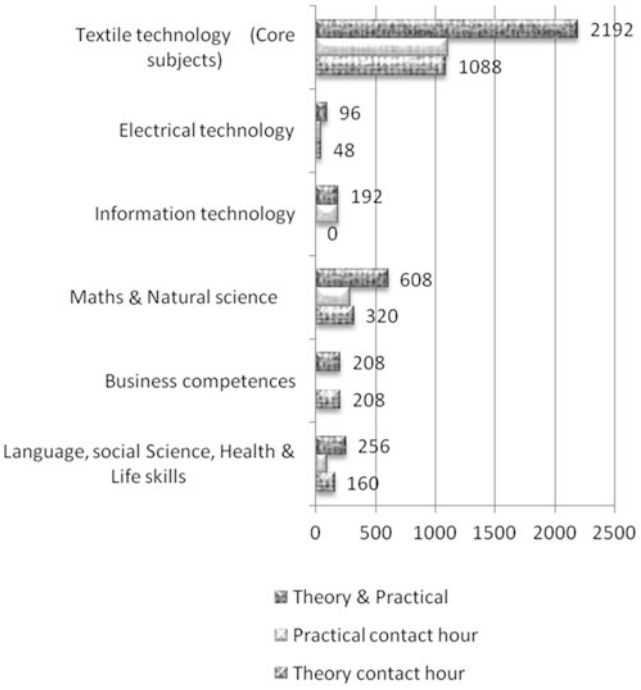

Fig. 11.6 Categories of subjects/distribution of contact hours in the diploma in textile technology curriculum (Source: author's own compilation from BTEB (2015) syllabus

Based on the above analysis it can be said that the Diploma curriculum is well organised and documented. It covers the core area of the occupation, the cross-occupational area, general/humanity courses, business/entrepreneurship related courses.

TVET curricula usually include content with different levels of learning objectives (Anderson et al. 2001; Bloom et al. 1956; Finch and Crunkilton 1999; Marzano and Kendall 2007, 2008, p.15; Krathwohl et al. 1973). Different types of tasks serve different learning objectives at different cognitive process levels.

To summarize, research results show that the Diploma in Engineering (Electronic Technology) curriculum focuses mainly on theoretical knowledge at the cognitive level 'reproduction' and 're-organization', and not on the practical relevant skills at the 'apply/transfer' level. Unless teachers practice tasks that are real world relevant, students will only learn basic theories and principles (Haolader and Nickolaus 2012; Haolader and Paul 2013).

Table 11.4 Distribution of weekly contact hours in SSC (Voc) & HSC (Voc) curricula

	Contact hours in SSC (Voc)			Contact hour in HSC (Voc)		
Subjects group	Theory	Practical	Total	Theory	Practical	Total
Trade core subject	4	18	22	3	15	18
Information technology	0	2	2	0	0.5	0.5
Math & natural science	10	3	13	9	6	15
Language & others	6	1	7	8	0	8
Entrepreneurship	2	0	2	0.5	0	0.5
Engineering drawing	0	2	2	1	3	4
Total	22	26	48	21.5	24.5	46

Source: author's own compilation based on SSC (Voc) & HSC (Voc) Curricula of BTEB (2015)

5.2 Curricula of SSC & HSC Vocational (Certificate Level)

BTEB offers two-Year SSCs with Vocational Skills, SSC (Voc) and two-Year Higher SSCs with Vocational Skills, HSC (Voc) and HSC (Business Management), programmes through TSC, TTC, or similar institutions. The SSC (Voc) programme is offered in 31 trades and HSC (Voc) programme is offered in 14 trades. The entry requirement of the SSC (Voc) is Junior School Certificate or Junior Dakhil Certificate. After completing the SSC (Voc), students can go to general stream of education, can choose a HSC (Voc) programme or a Diploma programme of study. Graduates with HSC (Voc) qualification might go to the world of work or can pursue higher education. The curricula of these Certificate level programmes are organised subject-wise. Table 11.4 shows the amount of theory and practical contact hours of both programmes. The total number of credit hours per week in theory and practical in the SSC (Voc) are 22 (46 %) and 26 (54 %), respectively, and that in the HSC (Voc) are 21.5 (46.7 %) and 24.5 (53.3 %). That means the curricular focus on theoretical knowledge and practical tasks in both programmes is similar.

Although these programmes are designed to build students' vocational/practical skills, the majority of formal TVET institutions fail to prepare their graduates to an acceptable level for entry into the job market. This is mainly because

> many trainers at vocational training institutes do not have any industry experience, they lack sufficient market knowledge, which is cited as something that is keenly lacking from graduates of secondary-level vocational institutes. (World Bank 2013, with reference to Hossain 2012)

The low levels of competency results partly from ineffective practical and theoretical classes and theory oriented, not competency-based, education/training and assessment (World Bank 2013, p. 155).

> Students' academic achievement is assessed largely on rote learning of facts rather than practical skills. (World Bank 2013, p. 155)

However, initiatives are being undertaken to develop competency-based curricula and assessments to improve graduates' vocational skills and knowledge for entry into the workplace (see Sect. 7 of this article).

Table 11.5 Summary of proposed competency units and duration

Sl. No.	Category of competency unit	NTVQF level	Nominal duration (Hours)
1	Generic – Compulsory (5 UoCs required)	1–4	200
2	Sector Specific – Compulsory (5 UoCs required)		150
3	Occupation Specific – Compulsory (21 UoCs required)		850
	Total nominal learning hours		1200

Source: author's own compilation based on BTEB (2016)

5.3 Short Courses (Certificate Level)

BTEB offers several short courses in a variety of durations, including one year, six months, three months and 360 hours. The 360-hours programme is offered in 53 trades and is often referred to as the basic trade course. A complete list of programmes can be seen on the BTEB website (www.bteb.gov.bd).

Competency Based Training (Curriculum) Standards of different levels of NTVQF qualifications for selected trades have been developed under the TVET Reform Project (EU 2015). (See also the current status at: www.btebcbt.gov.bd.)

Table 11.5 shows a summary of the competency units and duration for an occupation up to Level 4.

The effectiveness of this newly introduced CBT&A approach in Bangladesh compared to the traditional approach of TVET needs to be studied further before upscaling the new system which has shown initial promise.

6 Promoting Participation in TVET

Several initiatives have been taken to increase the rate of enrolment in technical and vocational education as a percentage of total enrolment in the formal education system.

Initiatives have also concentrated specifically on improving female participation in TVET, both in teaching staff and student numbers. One significant incentive is reserving 20 % of seats in courses for female students. Another is a recent directive to TVET institutions under the DTE to allocate 5 % of seats to persons with disabilities.

Other initiatives being implemented are listed below:

Government Stipend: 65 % of students in all public polytechnic institutes and TSC/TTC are financially supported, receiving Bangladeshi Taka (BDT) 905 and BDT 675 per semester (DTE 2015).

Incentives through projects: Institutes selected for financing under the Skills and Training Enhancement Project (STEP) receive a grant of maximum amount of BDT 7 million as an implementation grant.

Each institution receiving a financial grant is then also eligible for a performance grant. These grants (of up to BDT 1.4 million) are provided to institutions based on their achievements in terms of their student placement cell, expenditure level, number of teachers trained, and placement rate of students.

In addition, a stipend program is expected to support approximately 25,000 students a year for education with anticipated 8000 annual enrolments. Selected beneficiaries have to meet the following criteria to remain in the program: (a) maintain 75 % annual attendance; and (b) maintain 45 % pass marks in the annual examinations (DTE 2014a, pp. 2–4).

Support by STEP at a glance – Component –1, Window –1:

- 93 polytechnics (43 public, 50 private) have been selected for stipends and performance contracts signed.
- Up to December 2013, the project disbursed stipends among 75,457 students. From January to June 2014, all female students who applied for stipends received the support directly.
- 34 % intake increases in project polytechnic institutes.
- Selected 30 polytechnics (public-25, private-05) for implementation grant and performance contracts signed.
- 31,710 trainees received short course training and stipend @BDT 700 per month (DTE 2014b, pp. 51–52).

While these latter approaches are helpful, they are project based and temporary so more sustainable methods are needed to promote TVET as an option for trainees, their parents and guardians. For example, the Chief Executive Officer of the National Skills Development Council Secretariat has proposed that there is a coordinated communication strategy developed to promote TVET where Industry Skills Councils would also play a role so as to encourage young people to join their industry sectors. Experience in Bangladesh shows that events such as National TVET Week, skills competitions, job fairs, and of course media coverage promotes higher enrolment in TVET. At the same time, TVET institutions are being encouraged to establish career guidance cells and job placement units to help get their trainees jobs after they complete their programmes. Learning skills to gain employment is an important motivator in a country where about half of university graduates are unemployed.

7 Promoting Quality in TVET

TVET in Bangladesh has strengths as well as weaknesses. However, recognizing the importance of TVET, Bangladesh envisages not only for the increase of enrolment in TVET from current approximately 5–20 % in 2020 but also for the

improvement in the quality of TVET. In the NSDP and National Strategy for Accelerated Poverty Reduction, emphasis is given to the enhancement of workers' skills, which will ultimately increase the percentage of TVET graduates obtaining self- or wage-employment both in the domestic and international markets.

For achieving these goals the government with assistance from international donor community is trying to address the problems of the existing TVET system mentioned in the previous sections and have taken several initiatives/measures. For example, Bangladesh has the NSDP including a NTVQF as key commitments to the strengthening and further growth of skills development in Bangladesh. A national skills quality assurance system (BTEB 2012a, b), and curricula standards for selected occupations, which are job market relevant, are developed. The new system emphasizes job-oriented and need-based education (ILO 2014; EU 2015). Other ongoing initiatives include institutional restructuring and expansion, capacity building training for TVET professionals (managers, teachers, and lab technicians), introduction of a modern apprenticeship training programme, efficient management at all levels, as well as strengthening Information and Communication Technology use in TVET.

TVET provision under the reformed system, which adopts CBT&A training approach, enables engagement of TVET institutions with industries through industry skills councils (ISCs), industry to assess competency-based training (CBT) and to participate in new institution management committees. Through the introduction of NTVQF, the system has the provision to assess the existing labour force's skills by certifying their competency levels under the RPL program (ILO 2014, BTEB 2012a). RPL gives credit for competencies gained through previous learning through training or work and life experiences. Once workers' skill levels are certified, they can have access to further skills-building formal training opportunities or job in the formal sector (EU 2015; World Bank 2013, p. 172).

The country is benefiting from the effects of several major Skills Development Projects (SDPs) such as STEP, SDP, TVET Reform Project, B-SEP Project, which are variously funded by Bangladesh Government, the Asian Development Bank, the World Bank, the European Union, the Government of Canada, and other donors. Some initiatives are focusing on reforming the existing system with others strengthening infrastructure that can be used while the new system takes shape.

TVET and skills development continues to be of intense interest to both the Government of Bangladesh and the development partners.

8 Conclusion

TVET in Bangladesh is diverse. It covers a variety of occupations. Both the government and increasingly the market are taking the responsibility for the development of human resources of the country. It is gaining recognition as a vital tool for economic development. TVET and skills development more generally are an increasing

priority for both the Government of Bangladesh and international development partners.

For overcoming barriers to quality TVET in Bangladesh, this sub-sector requires, among others:

- Well-designed job market relevant programmes;
- Proper supervision of learning, strong individual and institutional accountability, and proper licensing of TVET institutions;
- Quality managers, sufficient teachers with adequate professional preparation in both subject matter including practical skills, and teaching methods, and with professional ethics and attitude;
- Sufficient and high quality textbooks and lab equipment;
- Good co-ordination among different levels of education and also among institutions, better teacher-student communication;
- A satisfactory level of students' basic competencies at entry-level and self-learning facilities at training institutes;
- Introduction of ICT to improve quality and reach of TVET, and
- More attention to research in TVET by specialised experts.
- (These suggestions are made based on World Bank 2013, 2007, 2006; ADB 2008; Khanam and Shamsuddoha 2003; and authors' own analysis.)

Furthermore, according to the structure of the curricula of both Diploma and Certificate level programmes, the practical content (calculated based on the contact hours) is between 54 and 59 %. The practical classes and the industrial attachment training are to be used more effectively for the development of students' practical competencies. To improve the effectiveness of the industrial attachment training one idea is to adopt a tool in formal TVET like the Competency Skills Log Book used in apprenticeship and to have the trainee, training institution and employer agree on its application. Similar arrangement of industrial attachment training/service for TVET teachers will help them acquiring current knowledge and skills demanded by the job market.

Maintaining the quality of the overall TVET system to ensure that improvements and initiatives are sustainable, coordinated and effective is of primary importance. The existing Bangladesh Quality Assurance System for TVET manual provides guidance. However, further studies on the outcomes of TVET/skills projects and the performance of TVET institutions in implementing the National Skills Development Policy including new occupational standards (competencies) are suggested.

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