

Stocktaking of Technical and Vocational Education and Training (TVET) Institutions in Bangladesh

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Abbreviations and Acronyms

ADB	: Asian Development Bank
AI	: Artificial Intelligence
BANBEIS	: Bangladesh Bureau of Educational Information and Statistics
BBS	: Bangladesh Bureau of Statistics
BEF	: Bangladesh Employers Federation
BITAC	: Bangladesh Industrial Technical Assistance Centre
BMET	: Bureau of Manpower, Employment and Training
BTEB	: Bangladesh Technical Education Board
CBT&A	: Competency Based Training and Assessment
COEs	: Centers of Excellence
DTE	: Directorate of Technical Education
4IR	: Fourth Industrial Revolution
GDP	: Gross Domestic Product
GOB	: Government of Bangladesh
ICT	: Information and Communication Technology
IOT	: Internet of Things
ISCs	: Industry Skills Councils
KPI	: Key Performance Indicator
LMI	: Labor Market Information
LMIS	: Labor Market Information System
MRA	: Mutual Recognition Agreement
NCCWE	: National Coordination Committee for Workers Education
NEP	: National Education Policy
NFEA	: Non-Formal Education Act
NHRDF	: National Human Resources Development Fund
NSQF	: National Skills Qualification Framework
NSDA	: National Skills Development Authority
NSDC	: National Skills Development Council
NSDP	: National Skills Development Policy
NSQA	: National Skills Quality Assessment
NSSB	: National Skill Standard Basic
NTVQF	: National Technical and Vocational Qualification Framework
PPB2041	: Perspective Plan of Bangladesh 2021-2041
PPP	: Public-Private Partnership
PPDP	: Public-Private-Donor Partnership
SDC	: Swiss Agency for Development and Cooperation
SDGs	: Sustainable Development Goals
SEIP	: Skills for Employment Investment Program
SFYP	: Seventh Five Year Plan
STP	: Skills Training Provider
3IR	: Third Industrial Revolution
TOT	: Training of Teachers
TVET	: Technical and Vocational Education and Training

Executive Summary

The study is essentially based on secondary data and information and largely relies on the TVET Institution Census 2015. It also draws upon consultations with the relevant stakeholders including *inter alia* members of the Executive Committee of NSDA, instructional staff of DTE and BMET, course and curriculum staff of BTEB, BITAC and social partners including BEF and NCCWE. All of these are supplemented by primary data collected through a field survey.

The stock of supply of skills by the TVET institutions in Bangladesh is primarily provided by four TVET streams: (i) Diploma Program, (ii) HSC (Voc)/BM, (iii) SSC/Dakhil (Voc), and (iv) NSSB Course. As in 2015, there are 13,163 TVET institutions in the country. Existing TVET institutions produced 17,43,000 graduates in 2015 with overwhelmingly highest proportion in NSSB course (77.2%). TVET institutions who are offering these courses usually conduct training as many shifts as they can accommodate.

For diploma graduates, electrical engineers account for the largest share followed by civil engineers and computer engineers. Garments and textile, agricultural and electronics engineers are also important trades in this stream. For HSC (Voc)/BM graduates, computer operation and maintenance figures prominently followed by secretarial science and accounting. For the SSC (Voc) graduates the most important trades are: i) Computer & information technology, ii) general mechanics, iii) general electrical works and iv) dress making. In NSSB course, computer operation/programming emerges as the single most important trade accounting for 42.24 percent of total graduates. Among other important trades in this stream are graphics design & multimedia programming, database programming, dress making & tailoring and hardware & networking.

Estimated trend rates of growth of BTEB approved graduates over the period 2011–2019 are: 8.16 for Diploma graduates, 4.01 for HSC (voc)/BM graduates, 2.38 for SSC/Dakhil (voc) graduates and 19.75 for NSSB course graduates. The average trend rate of growth of all TVET graduates is consistent with the GDP growth rate of the country and is most likely to continue into the future over the period 2020–2030.

The total supply of TVET graduates in the country is estimated at 8.8 million in 2025 (with 292,342 Diploma, 174,206 HSC Voc/BM, 186,071 SSC Voc and 8,157,564 NSSB) as well as at 20.9 million in 2030 (with 432,737 Diploma, 212,050 HSC Voc/BM, 209,291 SSC Voc and 20,088,067 NSSB) indicating that it would more than double every five years. This is more likely to be the scenario in the country because the capacity building of the TVET institutions and esp. NSSB courses are being generously supported by the donors, esp. by SEIP of ADB.

NSDA and BTEB are the statutory body to ensure TVET certification. BTEB approves TVET courses in 42.3 percent of the training institutions, while a larger share of the non-BTEB institutions have their own curricula indicating prevalence of a wide variety of course curricula followed by TVET institutions. Unqualified teachers and some government officials with little or no exposure to the world of work still tend to prepare and set curricula. Curriculum is not available in about one-third of TVET institutions not approved by BTEB. There is no qualified curriculum specialists in the non-BTEB institutions. Competency Standard and CBLM are current, accessible and implementable is being contributed by the SEIP. TVET institutions are in crisis of teachers in terms of not only number but also their competence in delivering skills. Besides, the TVET teachers are not trained in pedagogy, and have very limited practical skills and industrial experience. Consequently, the gap between the training system and employment needs and opportunities keeps widening and uniform quality and standard is not created and embedded telling heavily upon the effectiveness of TVET.

TVET institutions have a very poor infrastructure. Only 24.4 percent of institutions have an industrial attachment (2015) program. TVET institutions under individual ownership which account for the largest share of institutions have the least proportion of industrial attachments. Public sector institutions fare worse than all other types except those individually owned. The largest proportion of the institutions practicing hands-on training of their students in the industries have a duration of 1–3 months followed by less than one month and 3–6 months reflecting inadequate school-industry linkage in terms of duration. Currently, there are 260 institute-industry linkage and 119 industry-based trained teachers in BTEB approved institutions. Nationally only 8.4 percent of TVET institutions provide job placement facility, which is, however, increasing phenomenally due to SEIP intervention.

Skills mismatch is high ranging from 10.89 percent to 50 percent both in the short and longer term indicating that the effects of TVET on the probability of being mismatched are persistent. The effect of TVET on qualification mismatch appears to be driven mainly by a lower probability of under-qualification and higher probability of over-qualification. Among the diploma technology, skills mismatch figures most prominently in electro-medical and mining & mine survey followed by environmental, civil and civil wood. Among the HSC graduates, skills mismatch is most critical in fish culture & breeding (100%) followed by computer operation and maintenance, agro-machinery, refrigeration & air-conditioning and welding & fabrication. Among the SSC graduates, skills mismatch is most critical in agro-machinery, electronics control and communication, and refrigeration & air-conditioning (100% each) followed by fish culture and breeding, and welding & fabrication and clothing & garments finishing. Among the short course graduates, most prominent skills mismatches are found in plumbing & pipe fitting and welding & fabrication, and carpentry cum woodwork machine operation. There is no incidence of skills mismatch in the case of CNC machine operation and web designing. Most recent evidence, however, shows that skills mismatches have narrowed down significantly due to the implementation of market-responsive SEIP.

However, TVET graduates are in great demand in the labor market. Overall, they account for 53.9 percent of the total number of technical staff and workers employed in different sectors. The largest proportion of them are employed in the manufacturing of construction products followed in order by education, solar power, trading of agricultural products, manufacture of electrical products and electrical services.

Across the type of technical staff employed, there exists wide variation in the demand for TVET graduates. All the diploma engineers employed in education, solar power, services other than medical and electrical, and trading of agricultural products, are TVET graduates. The overwhelming majority of the TVET diploma graduates are employed in IT, garments, real estate/construction, manufacturing of electrical products, agro processing, electrical products service and medical service. TVET technicians are in great demand in education and solar power. Demand for them is non-existent in the manufacture of medical equipment, medical services and agro-processing. As for workers, largest share of the TVET graduates is found in the manufacture of electrical products (89.5%) followed by education.

Almost all the employers are satisfied with the performance of the TVET graduates indicating that TVET graduates are faring very well across the board. Almost all of them have full confidence in the competence of the TVET graduates who are both trainable and adaptable. There is no divided opinion among the employers in the manufacturing of electrical products and medical equipment, architecture firms, trading of agricultural products and production of solar power. For the majority of the employers, existing competence of the SEIP graduates is adequate.

However, quality and effectiveness of TVET is hampered by lack of trained teachers, lack of in-service training opportunities, absence of quality of teaching and learning outcomes, high vacancy rate for teaching positions in public training institutions, curriculum updating not adequately adaptive and overreliance on written examination, overemphasis on theory and testing rather than on practical

instructions, inadequate financing with use of old-fashioned equipment and training materials, and poor labor market research and linkage with industries.

For the development of skills training in the country, the GOB has undertaken a large number of policies and programs in the advancement of TVET over time. Substantial changes have taken place in the overall skills development system including legislation, administration, operation and implementation of various policies and programs. TVET Reforms Project spearheaded a paradigm shift in the key policy initiatives of the GOB resulting in the support to (i) NSDP 2011, (ii) NTVQF and (iii) NSDC. For improving the quality and relevance of TVET, most important landmark changes are: (a) enhanced skills training, (b) NTVQF implementation manual, (c) National quality assurance system, and (d) twelve new NTVQF programs – first ever. The number of programs is expanding. Currently, only RMG and Textile ISC, Construction ISC, Light Engineering ISC, Tourism and Hospitality ISC, Leather & Leather Goods ISC and Agro-Food ISC are functioning. The rest are not functioning reportedly due to the inertia of the sectoral leaders.

The NTVQF established in 2011 under the BTEB, is a comprehensive, nationally consistent framework for all qualifications in TVET in Bangladesh. The National Skills Quality Assessment (NSQA) system was established to ensure the quality of demand-based skills development. NSDP-2011 provided a national vision and direction for skills development and put a more concrete emphasis on three areas of focus: quality, equity and access, and governance. NEP-2010 provides a strategic approach to vocational and technical education to build up skilled manpower. NFEA-2014 focuses on *inter alia* opening up opportunities for lifelong learning and developing competence for self-employment. NSDA Act 2018 and BTEB Act 2018 are in line with the same goal. But the interface of these policies and regulatory interventions still remains a grey area. The NSDA Act, BTEB Act, and the NFE Act have some issues to be further clarified in line with the mandates and capacity of the respective authority. Issues are related to the RPL certification, training impartation, certification and accreditation of training providers. Both legislations allow the respective organizations to be involved in training quality improvement, certification and mutual recognition. However, draft NSDP-2020 with NSQF and NHRDF Rules-2020 are in place with a much greater promise of a paradigm shift in the skill development ecosystem of Bangladesh.

The major policy challenges are: (i) creating “decent work” to better wages and work conditions, (ii) appropriate alignment of SDGs in the development plans and programs and (iii) readiness to 4IR. They point to the need for steps to build stronger “foundational skills” through basic general education, “transferable skills” through secondary education and TVET and “job specific skills” through high quality TVET and apprenticeship along with soft skills. These skills building measures need to be combined with complementary policy intervention in the labor market and social protection for workers. Encouragingly, TVET system has developed capacity to address skills need of the informal sector which accounts for about 85.1 percent of total employment.

Another area of concern is the lack of systematic effort to prepare workers for overseas employment and raise their skills profile to improve their earnings and working condition. Most of these workers are low-skilled and working with low wages and in vulnerable conditions. It is necessary to develop relevant training structures that will be responsive to the needs of the international labor market in the age of 4IR.

NSDA and BTEB are the organizations responsible for the implementation of NTVQF and quality assurance of TVET through accreditation of training providers, curriculum development, examinations and certification. But the majority of TVET institutions still remain outside the jurisdiction of BTEB.

Policy Recommendations

In order to make the TVET system in Bangladesh demand-driven, policy interventions in four main areas are required: (i) Creating partnerships between employers, government and training institutes through appropriate arrangements; (ii) Undertaking labor market skills assessments in key economic sectors in

order to direct training provision to meet labor market demand; (iii) Designing new competency-based curriculum built on the skills profiles of specific occupations; and (iv) Raising awareness of the role of employers in TVET through campaigns and other initiatives.

1. Improved matching of skills demand and supply: The skills development system needs to be responsive and relevant to labor market needs, with good coordination between demand for and supply of skills. The policy should support active and regular engagement of the social partners to reflect their needs in planning and delivery of skills. Other means of improving skills matching include: (a) improving mechanisms for **anticipating skills demands** and disseminating the information to inform policy making and the planning of training; (b) **integrating strategies** that embed skills development within broader development strategies; (c) strengthening **quality assurance** in delivering training, through benchmarks and criteria for providers, and certification systems that increase the value of qualifications and certificates; (d) enhancing **employment services** to improve the matching of jobs and skills, the collection and provision of LMI (i.e. job opportunities and skills requirements), and the linkage of that information with training; (e) **more flexible training provisions** in respect of both content and delivery.

2. All efforts should be underpinned by continuous research: (i) Policy development and review should be supported by continuous research into various aspects of human resources development; and (ii) Continuous monitoring and evaluation of the policy's impact will provide key inputs for policy review.

3. Meeting today's and tomorrow's skills needs: In linking skills development to gains in productivity, employment and development, skills development policy should target three main objectives: (i) matching supply to current demand for skills – relevance and quality of training; (ii) helping workers and enterprises adjust to change – movement of workers and enterprises from declining or low-productivity activities and sectors into expanding and higher-productivity activities and sectors; and (iii) building and sustaining competencies for future labor market needs.

Convergence across policies: Skills and employment policies should be viewed together. For investments in training to yield maximum benefit to workers, enterprises and economy, country's capacity for coordination is most important in three areas: (i) connecting basic education to technical training, technical training to labor market entry, and labor market entry to workplace and lifelong learning; (ii) ensuring continuous communication between employers and training providers so that training meets the needs and aspirations of workers and enterprises; and (iii) integrating skills development policies with other policy areas – not only labor market and social protection policies, but also industrial, investment, trade and technology policies.

4. Building Blocks of Robust Training and Skills Development Strategies and Policies: Robust training and skills strategies and policies are constructed from a number of building blocks including *inter alia* anticipating future skills needs, participation of social partners, sectoral approaches, LMI and employment services, training quality and relevance, self-employment and the informal economy, and assessing policy performance.

5. Mainstreaming the SDGs: GOB's SDG commitments in TVET are primarily focused on increasing the quantity of training opportunities so that there is equal access for all. Quality, rather a balance between quality and quantity should factor in target setting, indicators and results framework for TVET in the context of SDGs. SDG 4 was aligned in the SFYP but could not bring in tangible results due to institutional bottlenecks. It has been realigned in the 8FYP and PPB2041 with a greater promise. Systemic and institutional arrangements will be put in place for early implementation of the skills needs for green jobs in various sectors, occupational profiles, curriculum design and training provision for greening existing occupations and for developing emerging and new green occupations. The best that skills policy can aim for is "islands of excellence" amidst skills gaps and shortages. National curricula

should encourage critical thinking, adaptive mindset and creative discussions from diverse perspectives, and give learners the opportunity to exchange knowledge and ideas on alternative solutions for economic, environmental and social issues.

6. Readiness to the Fourth Industrial Revolution

We are at the threshold of the Fourth Industrial Revolution (4IR) that will fundamentally alter the way of work. It is a fusion of advances in AI, robotics, the IOT, 3D printing, genetic engineering, quantum computing, and other technologies. It is the collective force behind many products and services that are fast becoming indispensable to modern life. This will give rise to a job market increasingly segregated into “low-skill/low-pay” and “high-skill/high-pay” segments leading to an increased social tension. Future jobs will increasingly require complex problem-solving, social and systems skills. An upward bias to skill requirements disproportionately affects older and lower-income cohorts and those working in industries most prone to automation by new technologies. An answer to this could be ‘continuous up-training’: a system that would allow every employee to devote significant time to acquiring fresh skills.

Specific policy interventions recommended include: (i) Activate and update NSDP-2020 to reflect the new challenges and opportunities of the TVET and skills development; (ii) Complete the rolling out of the NTVQF and NSQF; (iii) Operationalize the NTVQF and NSQF through government orders and through appropriate communication strategy; (iv) Address the issues related to NTVQF certification among BTEB and NSDA; (v) Assign a single competent agency to lead on the management of the LMI System (both supply and demand) to be supported by other relevant agencies; and (vi) Adapt TVET training to integrate all the skills mentioned in the portfolio and focus training on the top-ten skills noted in the text to prepare students with the best education for the job market in the future. The concept of lifelong learning, along with soft skills development, must be at the crux of the paradigm shift in the age of the 4IR.

I. Introduction

Bangladesh has made a remarkable success in achieving steady and persistent acceleration of growth over the last few decades, with about one percentage point increase in every decade since the 1980s. Average real GDP (Gross Domestic Product) growth over the last five years has been above 6.5 percent, which is much higher than the average growth rate of all developing countries (4.7 percent). Growth in Bangladesh accelerated from 7.9 percent in FY2018 to 8.1 percent in FY2019 with faster growth in industry and services. Investment rose from 31.2 percent of GDP in FY2018 to 31.6 percent in FY2019 (ADB, 2019). The economy now aspires to attain the high middle-income status by 2030, and developed country status by 2041. To this end, in addition to factor accumulation (capital and labor), the economy requires to upgrade the skill base of the labor force to enhance the productivity.

As indicated by labor force survey data that more than 60 percent of the labor force has either no education (40%) or only up to primary level (23%). With the approval of the National Education Policy (NEP) 2010 and the National Skills Development Policy (NSDP) 2011, the government embarked on major education and training reforms. In 2014, the Government of Bangladesh (GOB) has initiated the Skills for Employment Investment Program (SEIP), a multi-tranche financing facility supported by the Asian Development Bank (ADB) and Swiss Agency for Development and Cooperation (SDC). Under first and second Tranches, 223,000 have been trained and certified with a job placement rate of nearly 70 percent. The combined training target under the first two Tranches is 502,000. Female participation among trainees is more than 30 percent.

TVET is widely understood to be a key to achieving a range of Sustainable Development¹ Goals (SDGs) by 2030 including alleviation of poverty by empowering people to work and create jobs for others; increasing productivity and economic growth; promoting social equity, stability and peace; and increasing awareness of environmental issues and promoting green practices. TVET is regarded as pivotal to the achievement of inclusive, equitable and sustainable economic growth, youth employability and enhanced social well-being. A TVET system has the potential to influence work practices in the long run by emphasizing occupational and professional standards, through developing skills and knowledge for sustainable work practices and by introducing new technologies. SDG 4.4 says, by 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship; and 4.7 by 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development (UN, 2015).

In the context of TVET a compelling consideration is required to spell out the implications of global trends, especially the impact of overpowering and irresistible technological advances unleashed by the emerging Fourth Industrial Revolution (4IR) on the nature of jobs and skills requirement. Thus far the foreseeable impact of the advent of 4IR on the Bangladesh economy remains an uncharted territory. But it is crucially important to look at the probable scenario of Bangladesh 4.0 in understanding and estimating projected skills demand by sector, occupations and trade, as well as required supply through training, and how to build resilience to 4IR and respond to its challenges and opportunities.

¹ The commonly accepted definition of sustainable development is a development that “meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987).

In this backdrop, it is crucially important to (i) analyze labor supply and demand over the next 10-year period (2020-2030) in order to assist the government and the private industry to better plan the capacity and quality of skills training systems according to the evolving skills/trade/market demands from rapidly growing industry sectors; and (ii) determine sector priorities, assess skills gap by sector, analyze sector-wise occupational composition of employment (including gender composition of employment), assess occupation-wise training requirement by sector and trade.

I.1 Objective of the Study

Global experiences of TVET reveal that if properly tapped and tailored it can greatly contribute to the effective supply of skilled workforce in response to market demand in an economy and beyond. There exist huge gaps in the educational attainment and training of the labor force. According to the Bangladesh Labour Force Surveys, over the period 2005-06/2016-17 working age population who received vocational training came down to a low of 1.7 percent in 2016-17 from the highest 5.4 percent in 2013.

Thus, past studies pointed to the ineffectiveness of the existing TVET system in Bangladesh and come to the conclusions that there exists huge skills shortages, gaps, and mismatches in the labor market. All this points to a fresh look at the stock of the supply of skills, particularly the trade-wise training offered by the TVET institutions. Understanding of the industry-demand for skills and the supply of skills by the TVET institutions will help identify the skills gaps of the labor market and the areas of potential interventions by the ongoing SEIP of ADB.

In order to assess the shortage or mismatch of skills, it is essential to take stock of the supply of skills, particularly the trade-wise training offered by the TVET institutions. To this end, the specific objectives of the present study are the following:

- Understanding of the supply of skills by the TVET institutions i.e., mapping the supply of skills with institutional landscape;
- Understanding of the current course curricula, quality of trainers and infrastructure of the TVET institutions;
- Understanding of mismatch between the market demand and the supply of skills by TVET; and
- Understanding of the government's policy and interventions in the development of TVET.

The central purpose of this study is to investigate the effectiveness of the supply of TVET graduates in terms of market relevance and demand, its quality and sustainability.

I.2 Methodology of the Study

The study is essentially based on the secondary data and information available primarily with Bangladesh Bureau of Statistics (BBS), Bangladesh Bureau of Educational Information and Statistics (BANBEIS), Directorate of Technical Education (DTE), Bangladesh Technical Education Board (BTEB) and Bureau of Manpower, Employment and Training (BMET). To this end, we largely relied on the TVET Institution Census 2015, other secondary data and information as well as consultations with the relevant stakeholders including *inter alia* members of the Executive Committee of National Skills Development Authority (NSDA), teaching and training staff of DTE and BMET, course and curriculum design staff of BTEB, Bangladesh Industrial Technical Assistance Centre (BITAC) and social partners including Bangladesh Employers Federation (BEF) and National Coordination Committee for Workers Education (NCCWE).

Available secondary data and information were supplemented by primary data collected through a BIDS field survey based on a sample of 155 TVET institutions (25 public, 9 NGO & 121 private), a sample of 324 TVET graduates (who graduated one year ago), and a sample of 324 current TVET students. The field survey took place during January–February 2021.

The trade-wise supply of skills has been assessed by using the TVET Institution Census 2015 – the first ever and the only TVET institutions census in the country – as the benchmark. The information recorded by the 2015 Census which were of relevance to labor market supply analysis include among others number of TVET institutions by ministry/departments, division and locality, seat capacity by activity, distribution of teachers by education status and TVET trade course, extent of industrial attachment, types of TVET institutions, seat capacity/admission/examinee/passed statistics by four broad TVET streams: four years' duration courses (diploma), two years' duration courses (HSC Voc/BM, SSC/Dakhil (Voc) and six-months' duration National Skills Standard Basic (NSSB)/short courses. In order to assess the potential national supply of TVET graduates seat capacities in all the four broad TVET streams have been taken into account in figuring out actual national supply of TVET graduates. Several adjustments were made to arrive at the actual supply of trained graduates because several past studies (Mondal & Chowdhury, 2015; Mondal, 2018b) reveal that a large number of the TVET graduates (esp. SSC and HSC Voc) go for higher studies and other pursuits and do not enter the labor market. BIDS field survey undertaken for the present study also comes up with the same finding.

In addition, the present study heavily draws upon international success stories of TVET.

II. Understanding of the Supply of Skills by the TVET Institutions

II.1 Stock of the Supply of Skills

The landscape of the skills supply in Bangladesh encompasses an array of formal, non-formal and informal skills training and learning outcomes. Formal skills learning refers to what takes place in the education and training system of Bangladesh. It is official, structured, organized by public organizations or recognized private institutions and results with formal certification and formal level of qualification which is recognized by relevant national educational and training authorities. Formal education and training is usually organized as full-time education and training and is organized as a continuous process with defined stages. Formal education and training culminate in the achievement of a degree or a professional qualification. Non-formal skills learning is characterized by any organization pursuing training purposes. Thus, non-formal skills training is any type of structured and organized skills learning which is institutionalized, intentional and planned by a training provider, but which does not lead to formal level of qualification recognized by the relevant national training authorities. People of all age groups can participate in non-formal skills training which is offered through predesigned courses. Informal skills learning is unofficial, unstructured and unorganized activities in everyday situations and interactions that take place within the context of work (e.g. on-the-job), family and leisure (e.g. hereditary skills), i.e. it is without external support and is not institutionalized. In the training process, therefore, the soft dimensions come into play that enable especially those who do not have access to the resources that allow them to be active and able skills training participants. The present exercise covers only formal and non-formal TVET institutions covering all public and private skills training providers including those of nongovernmental organizations (NGOs) such as Bangladesh Rural Advancement Committee (BRAC).

The stock of supply of skills by the TVET institutions in Bangladesh is provided primarily by four TVET streams: (i) Diploma Program, (ii) HSC (Voc)/BM, (iii) SSC/Dakhil (Voc), and (iv) National Skills Standard Basic (NSSB) Course. The only available most comprehensive TVET Institution Census 2015 reported 13,163 TVET institutions in the country of which 55 percent are urban and 45 percent are rural. Dhaka Division accounts for the largest proportion (31.2%) of TVET institutions followed by Rajshahi Division (15.9%), Chattogram Division (14.9%), Khulna Division (14.1%) and Rangpur Division (12.9). In terms of ownership, the share of individually/family owned institutions figures most prominently (48%) followed by MPO (Monthly Pay Order) included institutions (19.1%), public institutions (13.2%) and non-MPO institutions (12.3%). The share of partnership, corporate and other types of institutions is negligible. TVET institutions attached with 24 ministries account for 69.7 percent while institutions not attached to any ministry account for 30.3 percent of total number of TVET institutions. According to the micro-data of TVET Institution Census 2015, existing TVET institutions produced 17,43,000 graduates in 2015. Table-2.1 shows that the admission of NSSB course is more than double the seat capacity. This finding is largely corroborated by the BIDS field survey of TVET (January-February 2021). This is attributable to the fact that TVET institutions who are offering these courses usually conduct training as many shifts as they can accommodate.

Table-2.1: Seat Capacity & Students by Four TVET Streams (Number in '000')

Type of Course	Seat Capacity	Admission	Examinee	Passed
Diploma Program	173	154	144	133
HSC (Voc)/BM	184	143	132	118
SSC/Dakhil (Voc)	208	167	151	147
NSS Basic	517	1,301	1363	1345
Bangladesh Total	1,082	1,765	1,790	1,743

Source: TVET Institution Census 2015, Micro-data.

II.2 Supply of Skills by Trade

Table-3.2 shows that total stock of the supply of skills as measured by the number of TVET graduates amounts to 1.74 million in 2015 of which about 1.35 million are NSSB short course graduates (77.17%), 147.07 thousand are SSC/Dakhil (Voc) graduates (8.44%), 133.42 thousand are diploma graduates (7.65%) and 117.57 thousand are HSC (Voc)/BM graduates (6.74%). Trades under these four TVET streams vary considerably although some of them are common (e.g. computer operation/programming, refrigeration & air Conditioning, welding and fabrication etc.) indicating that they have different levels of knowledge and skills intensity.

In the case of diploma graduates, electrical engineers account for the largest share (15.95%) followed closely by civil engineers (13.65%) and computer engineers (12.23%). In the case of HSC (Voc)/BM graduates, computer operation and maintenance figures most prominently (31.03%) followed in order by secretarial science/shorthand (26.45%) and accounting (17.1%). Among other important trades in this stream, is entrepreneurship development and banking. For the SSC/Dakhil (Voc) graduates the most important trades are: computer & information technology (16.97%), general mechanics (12.2%), general electrical works (12.1%) and dress making (11.47%). Among other notable trades in this stream are building maintenance (6.43%), general electronics (4.75%), food processing & preservation, electrical maintenance works and agro-based food. In the lowest echelon of TVET stream, computer operation/programming emerges as the single most important trade accounting for 42.24 percent of the NSSB graduates. Among other important trades in this stream are graphics design & multimedia programming (6.69%), database programming (5.85%), dress making & tailoring (5.61%) and hardware & networking (4.8%). However, unclassified trades (others) in this stream comes out the highest (15.78%) of all streams concealing a large number of trades (Table-2.2).

Trades/Occupations	TVET Graduates in 2015	
	Number	%
1. Diploma in Engineering		
1. Agricultural	7139	5.35
2. Aircraft Maintenance (Aerospace)	267	0.20
3. Aircraft Maintenance (Avionics)	229	0.17
4. Architecture	2400	1.80
5. Architecture & Interior Design	1105	0.83
6. Automobile	1905	1.43
7. Ceramics	381	0.29
8. Chemical	229	0.17
9. Civil	18213	13.65
10. Civil (Wood)	38	0.03
11. Computer	16311	12.23
12. Computer Science & Electro Medical	991	0.74
13. Construction	572	0.43
14. Data Telecommunication & Networking	152	0.11
15. Dental	4084	3.06
16. Electrical	21281	15.95
17. Electronics	5604	4.20
18. Environmental, Instrumentation & Process Control	572	0.43
19. Fisheries	1295	0.97
20. Food	1067	0.80
21. Forestry	39	0.03
22. Garments and Clothing	8206	6.15
23. Garments Design & Pattern Making	5170	3.87

Table-2.2: Supply of Skills by Trade in 2015		
Trades/Occupations	TVET Graduates in 2015	
	Number	%
24. Glass	191	0.14
25. Integrated Medicine	107	0.08
26. Jute	152	0.11
27. Laboratory	7272	5.45
28. Marine	2057	1.54
29. Mechanical	4372	3.28
30. Mechatronics	229	0.17
31. Medical	305	0.23
32. Mining & Mine Survey	38	0.03
33. Patient Care	1661	1.24
34. Pharmacy	3253	2.44
35. Physiotherapy	1951	1.46
36. Power	1334	1.00
37. Printing/Graphics Design	838	0.63
38. Radiology & Imaging	1113	0.83
39. Refrigeration & Air Conditioning	1438	1.08
40. Ship Building	1029	0.77
41. Surveying	1029	0.77
42. Telecommunication	1248	0.94
43. Wet Processing	381	0.29
44. Yarn Manufacturing	1753	1.31
Others	4420	3.31
Sub-Total of Diploma	133421	100.00
2. HSC Voc. & BM		
1. Accounting	20058	17.06
2. Agro-machinery	674	0.57
3. Automobile	521	0.44
4. Banking	6974	5.93
5. Building Construction & Maintenance	624	0.53
6. Clothing & Garments Finishing	416	0.35
7. Computer Operation & Maintenance	36483	31.03
8. Drafting & Civil	132	0.11
9. Electrical Works & Maintenance	2259	1.92
10. Electronic Control & Communication	327	0.28
11. Entrepreneurship Development	7560	6.43
12. Fish Culture & Breeding	180	0.15
13. Industrial Wood Working	217	0.18
14. Machine Tools Operation & Maintenance	376	0.32
15. Poultry Rearing & Farming	253	0.22
16. Refrigeration & Air Conditioning	706	0.60
17. Secretarial Science/Shorthand	31099	26.45
18. Welding & Fabrication	819	0.70
19. Yarn & Fabric Manufacturing	94	0.08
Other trades	7802	6.64
Sub-Total HSC Voc. & BM	117,574	100.00
3. SSC/Dakhil (Vocational)		
1. Agro-based Food	3173	2.16
2. Architectural Drafting with CAD	583	0.40
3. Automotive	2806	1.91
4. Building Maintenance	9451	6.43

Table-2.2: Supply of Skills by Trade in 2015		
Trades/Occupations	TVET Graduates in 2015	
	Number	%
5. Ceramics	197	0.13
6. Civil Construction	3650	2.48
7. Civil Drafting with CAD	903	0.61
8. Computer & Information Technology	24967	16.97
9. Dress Making	16889	11.47
10. Dyeing, Printing & Finishing	1434	0.97
11. Electrical Maintenance Works	3837	2.61
12. Farm Machinery	2126	1.45
13. Fish Culture & Breeding	1704	1.16
14. Food Processing & Preservation	4481	3.05
15. Fruit & Vegetable Cultivation	1230	0.84
16. General Electrical Works	17721	12.05
17. General Electronics	6981	4.75
18. General Mechanics	17939	12.20
19. Glass	190	0.13
20. Knitting	387	0.26
21. Livestock Rearing & Farming	364	0.25
22. Machine Tools Operation	908	0.62
23. Mechanical Drafting with CAD	503	0.34
24. Patient Care Technique	342	0.23
25. Plumbing & Pipe Fitting	431	0.29
26. Poultry Rearing & Farming	2334	1.59
27. Refrigeration & Air Conditioning	3390	2.30
28. Shrimp Culture & Breeding	394	0.27
29. Weaving	833	0.57
30. Welding & Fabrication	1861	1.27
31. Wood Working	947	0.64
Other trades	14117	9.60
Sub-Total of SSC & Dakhil (Voc.)	147,073	100.00
4. National Skill Standard Basic		
1. Acting & Presentation	155	0.01
2. Air Hostess & Cabin Crew	983	0.07
3. Aminship (Surveyor)	3476	0.26
4. Apparel Merchandising	2254	0.17
5. Arc and Gas Welding	5309	0.39
6. Arc Welding	5039	0.37
7. AutoCAD	12550	0.93
8. Auto-mechanics	5735	0.43
9. Aviation Management	817	0.06
10. Bamboo, Cane & Mat Industry	7939	0.59
11. Building & Architectural Drafting with AutoCAD	5012	0.37
12. Certificate in Pattern Making	1411	0.10
13. Civil Construction	4919	0.37
14. Computer Operation/Programming	568271	42.24
15. Database Programming	78730	5.85
16. Diesel Mechanics	3469	0.26
17. Drafting Civil	1270	0.09
18. Dress Making & Tailoring	75484	5.61
19. Electrical House Wiring	23675	1.76
20. Food & Beverage Production/Service	4937	0.37

Trades/Occupations	TVET Graduates in 2015	
	Number	%
21. Food Processing & Preservation	6385	0.47
22. Furniture & Cabinet Making	2074	0.15
23. General Electrician	6310	0.47
24. General Mechanics	2461	0.18
25. Graphics Design & Multimedia Programming	90064	6.69
26. Hair Dressing	17889	1.33
27. Hardware & Networking	64533	4.80
28. Housekeeping	13866	1.03
29. Industrial Sewing Machine & Maintenance	6786	0.50
30. Interior Decoration (Gypsum Decoration)	723	0.05
31. Leather Goods & Footwear/Technology	4011	0.30
32. Machinist	2264	0.17
33. Maintenance of Electrical Equipment	2704	0.20
34. Masonry and Rod Binding	3655	0.27
35. Mobile Phone Servicing	21822	1.62
36. Motorcycle Mechanics	2598	0.19
37. Pastry and Bakery Production	4536	0.34
38. Plumbing & Pipe Fitting	7488	0.56
39. Radio & Television Servicing	5397	0.40
40. Refrigeration & Air Conditioning	13180	0.98
41. Secretarial Science	5143	0.38
42. Ship Fabrication	3169	0.24
43. TIG & MIG Welding	1694	0.13
44. Tiles Setting/Fitting	4425	0.33
45. Travel, Tourism & Ticketing	2032	0.15
46. Turner	1239	0.10
47. Welding 4G	4550	0.34
48. Welding 6G	4703	0.35
49. Welding & Fabrication	15334	1.14
50. Work Study Production Planning & Apparel Manufacturing	551	0.04
51. Other trades	212236	15.78
Sub-Total NSSB	1,345,257	100.00
GRAND TOTAL (All Streams)	1,743,325	
Source: TVET Institution Census 2015, Micro-data.		

BIDS survey finds that average enrollment capacity of the Diploma institutions varies widely from 100 in environmental, instrumentation & process control to 501 in computer in the public institutions, from 20 in refrigeration & air-conditioning to 71 in civil in the NGO institutions, and from 6 in garments design & pattern making to 88 in computer science & electro medical in the private institutions. Considerable underutilization of the seat capacity exists in almost all trades except refrigeration & air-conditioning in the NGO institutions and computer science & electro-medical, electrical, fisheries, garments & clothing, garments design & pattern making, marine and mechanical trades in the private institutions where overutilization of seat capacity is in evidence in 2018 and 2019 (Annex-2: Table-1.11). Average enrolment capacity of the HSC (Voc)/BM institutions varies widely from 40 in clothing & garments finishing to 53 each in automobile/automotive and electronic control & communication. In each trade average enrolment capacity of the TVET institutions is much higher than actual enrollment of the students in both 2018 and 2019 reflecting considerable underutilization of their existing capacity. Average enrolment capacity of the SSC/Dakhil (Voc) institutions varies widely from 30 each in architectural drafting with CAD, farm machinery, wood working and other related trades to 42 each in automotive and computer & information technology. In each trade average enrolment capacity of the TVET institutions is much higher than actual

enrollment of the students in both 2018 and 2019 reflecting considerable underutilization of their existing capacity. More strikingly, machine tools operation trade which has a seat capacity of 40 shows no enrollment either in 2018 or in 2019 (Annex-2: Table-1.14). Average enrolment capacity of the public SSC/Dakhil (Voc) institutions varies widely from 30 each in architectural drafting with CAD, farm machinery, electrical maintenance works, wood working and welding & fabrication trades to 60 in automotive. In each trade average enrolment capacity of the public institutions is much higher than actual enrollment of the students in both 2018 and 2019 reflecting considerable underutilization of their existing capacity (Annex-2: Table-1.17a). Average enrolment capacity of all the private SSC/Dakhil (Voc) institutions is 40 in each trade. In each trade average enrolment capacity of the TVET institutions is much higher than actual enrollment of the students in both 2018 and 2019 reflecting considerable underutilization of their existing capacity. More strikingly, machine tools operation and welding & fabrication trades which have a seat capacity of 40 each show no enrollment either in 2018 or in 2019 indicating no capacity utilization (Annex-2: Table-1.17b). Average enrolment capacity of the NGO SSC/Dakhil (Voc) institutions varies widely from 30 each in architectural drafting with CAD and refrigeration & air conditioning trades to 42 in civil construction. In most of the trades average enrolment capacity of the NGO institutions is much higher than actual enrollment of the students in both 2018 and 2019 (Annex-2: Table-1.17c) reflecting considerable underutilization of their existing capacity. By and large, underutilization of existing seat capacity is most acute in the private institutions. Average enrollment capacity of NSSB institutions indicates considerable diversity across three types. Average enrolment capacity varies widely from 20 in maintenance of electrical equipment to 98 in computer operation/programming in the public institutions, from 20 each in general electrician, secretarial sciences and welding & fabrication to 110 in arc & gas welding in the NGO institutions, and from 10 in machinist to 80 in computer operation/programming in the private institutions. While there is no utilization of the seat capacity in welding & fabrication in the case of public institutions and in bamboo, cane & mat industry as well as maintenance of electrical equipment in the case of private institutions, there exists overutilization of seat capacity in almost all the remaining trades of all types of institutions in 2018 and 2019 (Annex-2: Table-1.20).

BIDS survey further found that average academic performance of the Diploma institutions is far better in the NGO institutions than in the public and private institutions. The average pass rate in the NGO institutions is 87.83 percent in 2018 and 87.42 percent in 2019 compared to 85.27 percent in 2018 and 79.48 percent in 2019 for public and 83.49 percent in 2018 and 87.36 percent in 2019 for private institutions. The proportion of the graduates obtaining CGPA 3.5-4 is also the highest in the NGO institutions with 16.67 percent in 2018 and 16.63 percent in 2019 as against 14.73 percent in 2018 and 14.05 percent in 2019 for public and 15.34 percent in 2018 and 11.89 percent in 2019 for private institutions (Annex-2: Table-1.12). Average results of HSC (Vocational)/BM institutions show 96.96 percent pass in 2018 and 86.58 percent pass in 2019 indicating more than 10 percentage point annual decline in the success rate of the students. However, students obtaining GPA 4.5-4.99 & GPA 5 together show a simple majority in 2018 but a clear majority in 2019 reflecting considerable qualitative improvement of the results in 2019 (Annex-2: Table-1.15). Average results of SSC/Dakhil (Vocational) institutions show 78.67 percent pass in 2018 and 81.57 percent pass in 2019 indicating considerable improvement in the success rate of the students. However, students obtaining GPA 4.5-4.99 & GPA 5 together account for 79.89 percent in 2018 and 70.91 percent in 2019 of total successful students reflecting substantial qualitative decline in the results (Annex-2: Table-1.18). Average results of public SSC/Dakhil (Vocational) institutions show 72.88 percent pass in 2018 and 78.77 percent pass in 2019 indicating considerable improvement in the success rate of the students. However, students obtaining GPA 4.5-4.99 & GPA 5 together account for 65.78 percent in 2018 and 59.13 percent in 2019 of total successful students reflecting substantial qualitative decline in the results of the public institutions (Annex-2: Table-1.17a). Average results of private SSC/Dakhil (Vocational) institutions show 99.17 percent pass in 2018 and 99.18 percent pass in 2019 indicating excellent and steady success rate of the students in the private institutions. In the same vein, students obtaining GPA 4.5-4.99 & GPA 5 together

account for 100 percent in 2018 and 100 percent in 2019 of total successful students reflecting by far the best qualitative and quantitative results of the private institutions (Annex-2: Table-1.17b). Average results of NGO SSC/Dakhil (Vocational) institutions show 81.48 percent pass in 2018 and 82.72 percent pass in 2019 indicating slight improvement in the success rate of the students. However, students obtaining GPA 4.5-4.99 & GPA 5 together account for 79.92 percent in 2018 and 75.68 percent in 2019 of total successful students reflecting substantial qualitative decline in the results of the NGO institutions (Annex-2: Table-1.21). Public institutions present by far the best average results of NSSB students with 97.38 percent pass in 2018 and 96.41 percent pass in 2019 followed by private institutions with 92.2 percent pass in 2018 and 90.76 percent pass in 2019 and NGO institutions with 83.54 percent pass in 2018 and 84.14 percent pass in 2019 (Annex-2: Table-1.14). Thus, the academic performance of the NGO institutions in the NSSB course is not as good as usual. Besides, in the case of NGO institutions there is no evidence of pass in welding 4G trade in 2018 and 2019.

II.3 Projection and Analysis of the Supply of Skills by Trade over the Period 2020-2030

Skills Supply Forecasting

Skills supply forecasting means to make an estimation of the supply of TVET graduates taking into consideration the analysis of the current TVET graduates inventory and their future availability for net labor market entry.

Existing Inventory: The first step in the skills supply forecasting is to take a stock of existing TVET graduates as follows:

(a) Head Count: Count of the total number of TVET graduates available trade-wise in 2015 as the benchmark (base-year).

(b) Streams Inventory: It consists of existing four streams (Diploma, HSC, SSC & NSSB) referring to the levels in the TVET system i.e. in addition to other uncommon categories of skills, the stream related to the same category of skills like computer operator/programmer, air-conditioning and refrigeration, welding etc.

One of the problems skills supply forecasting needs to address is to avoid skills mismatch, by no means a new phenomenon². Over-education – people who work in a job below their education level – signals over-investments in education which are costly to society, while under-education – people who work in a job above their education level – signals under-investments in human capital that could result in productivity loss. The literature discusses over- and under-qualification at individual level (such as wage and welfare effects of skills mismatches, see Hartog, 2000; Sloane, 2003; Leuven and Oosterbeek, 2011). These studies show that overqualified workers suffer from wage penalties relative to workers whose education is better matched to their jobs, whereas they earn more than others at their respective job level if they are overqualified.

There is a tendency for people to attain higher level qualifications in all economies. This move towards higher levels of education has the potential to result in over-qualification if skills demanded do not increase in line with supply. In general, it is expected that the increase in the number of people with higher

² Richard Freeman's 1976 book, *The Overeducated American*, was the first to touch on the issue of individuals working in jobs below their level of education. Ever since, there has been a lively debate as to the cause and consequences of skills mismatch (and over-education in particular), and the body of literature has been growing.

level of qualifications grows broadly in line with the expected trend in skills demand. Increase in the high educated workforce is essential to the development of a knowledge-based and innovative economy.

The basic methods adopted for quantitative modeling can be classified under the following headings: (a) extrapolation of past trends, (b) more complex time series methods, and (c) introducing behavioral content. Extrapolative techniques are often used, especially where only very limited time series information is available. In many cases, only one or two observations are available on occupation structure and this clearly limits the sophistication of what can be done! Where more time series observations are available, much more sophisticated analysis is possible; this attempts to find patterns in a time series that can be used to predict its future path. Such approaches are widely used in the business and financial world, although they are much better at predicting short-term change than longer-term patterns.

In the present exercise of national skills supply projection, information on the total number of TVET graduates at the national level are available only for 2015. However, time-series information on the total number of stream-wise TVET graduates in the BTEB approved institutions are available in the Annual Reports of BTEB. This information has been used as a surrogate for national estimate. Trend rates of growth of BTEB approved TVET graduates in the four streams have been estimated on the basis of the following semi-logarithmic equation:

$$\text{Log } Y = a + bT$$

Where, Y = total number of BTEB approved TVET graduates,

a = a constant, and

b = coefficient of time (year) T.

T covers the period 2011–2019. Estimated trend rates of growth are 8.16 for Diploma graduates, 4.01 for HSC (voc)/BM graduates, 2.38 for SSC/Dakhil (voc) graduates and 19.75 for NSSB graduates. The average trend rate of growth of all TVET graduates is consistent with the average GDP growth rate of the country and is most likely to continue into the future over the period 2020–2030 (Table-2.3).

Trades/Occupations	Number of Graduates			
	2015 (Base Year)	2020	2025	2030
1. Diploma in Engineering				
1. Agricultural	7139	10567	15642	23155
2. Aircraft Maintenance (Aerospace)	267	395	585	866
3. Aircraft Maintenance (Avionics)	229	339	502	743
4. Architecture	2400	3553	5259	7784
5. Architecture & Interior Design	1105	1636	2421	3584
6. Automobile	1905	2820	4174	6179
7. Ceramics	381	564	835	1236
8. Chemical	229	339	502	743
9. Civil	18213	26960	39907	59072
10. Civil (Wood)	38	56	83	123
11. Computer	16311	24144	35739	52903
12. Computer Science & Electro Medical	991	1467	2171	3214
13. Construction	572	847	1253	1855
14. Data Telecommunication & Networking	152	225	333	493
15. Dental	4084	6045	8949	13246

Table-2.3: TVET Skills Supply Projection in Bangladesh (2020–2030)				
Trades/Occupations	Number of Graduates			
	2015 (Base Year)	2020	2025	2030
16. Electrical	21281	31501	46629	69023
17. Electronics	5604	8295	12279	18176
18. Environmental, Instrumentation & Process Control	572	847	1253	1855
19. Fisheries	1295	1917	2838	4200
20. Food	1067	1579	2338	3461
21. Forestry	39	58	85	126
22. Garments and Clothing	8206	12147	17980	26615
23. Garments Design & Pattern Making	5170	7653	11328	16768
24. Glass	191	283	419	619
25. Integrated Medicine	107	158	234	347
26. Jute	152	225	333	493
27. Laboratory	7272	10764	15934	23586
28. Marine	2057	3045	4507	6672
29. Mechanical	4372	6472	9580	14180
30. Mechatronics	229	339	502	743
31. Medical	305	451	668	989
32. Mining & Mine Survey	38	56	83	123
33. Patient Care	1661	2459	3639	5387
34. Pharmacy	3253	4815	7128	10551
35. Physiotherapy	1951	2888	4275	6328
36. Power	1334	1975	2923	4327
37. Printing/Graphics Design	838	1240	1836	2718
38. Radiology & Imaging	1113	1648	2439	3610
39. Refrigeration & Air Conditioning	1438	2129	3151	4664
40. Ship Building	1029	1523	2255	3337
41. Surveying	1029	1523	2255	3337
42. Telecommunication	1248	1847	2735	4048
43. Wet Processing	381	564	835	1236
44. Yarn Manufacturing	1753	2595	3841	5686
Others	4420	6543	9685	14336
Sub-Total of Diploma	133421	197496	292342	432737
2. HSC Voc. & BM				
1. Accounting	20058	24415	29719	36176
2. Agro-machinery	674	820	999	1216
3. Automobile	521	634	772	940
4. Banking	6974	8489	10333	12578
5. Building Construction & Maintenance	624	760	925	1125
6. Clothing & Garments Finishing	416	506	616	750
7. Computer Operation & Maintenance	36483	44409	54056	65799
8. Drafting & Civil	132	161	196	238
9. Electrical Works & Maintenance	2259	2750	3347	4074
10. Electronic Control & Communication	327	398	485	590
11. Entrepreneurship Development	7560	9202	11201	13635
12. Fish Culture & Breeding	180	219	267	325
13. Industrial Wood Working	217	264	322	391
14. Machine Tools Operation & Maintenance	376	458	557	678
15. Poultry Rearing & Farming	253	308	375	456
16. Refrigeration & Air Conditioning	706	859	1046	1273
17. Secretarial Science/Shorthand	31099	37855	46078	56088

Table-2.3: TVET Skills Supply Projection in Bangladesh (2020–2030)				
Trades/Occupations	Number of Graduates			
	2015 (Base Year)	2020	2025	2030
18. Welding & Fabrication	819	997	1213	1477
19. Yarn & Fabric Manufacturing	94	114	139	170
Other trades	7802	9497	11560	14071
Sub-Total HSC Voc. & BM	117,574	143115	174206	212050
3. SSC/Dakhil (Vocational)				
1. Agro-based Food	3173	3569	4014	4515
2. Architectural Drafting with CAD	583	656	738	830
3. Automotive	2806	3156	3550	3993
4. Building Maintenance	9451	10631	11957	13449
5. Ceramics	197	222	249	280
6. Civil Construction	3650	4106	4618	5194
7. Civil Drafting with CAD	903	1016	1142	1285
8. Computer & Information Technology	24967	28083	31588	35530
9. Dress Making	16889	18997	21368	24034
10. Dyeing, Printing & Finishing	1434	1613	1814	2041
11. Electrical Maintenance Works	3837	4316	4854	5460
12. Farm Machinery	2126	2391	2690	3025
13. Fish Culture & Breeding	1704	1917	2156	2425
14. Food Processing & Preservation	4481	5040	5669	6377
15. Fruit & Vegetable Cultivation	1230	1384	1556	1750
16. General Electrical Works	17721	19933	22420	25218
17. General Electronics	6981	7852	8832	9934
18. General Mechanics	17939	20178	22696	25528
19. Glass	190	214	240	270
20. Knitting	387	435	490	551
21. Livestock Rearing & Farming	364	409	461	518
22. Machine Tools Operation	908	1021	1149	1292
23. Mechanical Drafting with CAD	503	566	636	716
24. Patient Care Technique	342	385	433	487
25. Plumbing & Pipe Fitting	431	485	545	613
26. Poultry Rearing & Farming	2334	2625	2953	3321
27. Refrigeration & Air Conditioning	3390	3813	4289	4824
28. Shrimp Culture & Breeding	394	443	498	561
29. Weaving	833	937	1054	1185
30. Welding & Fabrication	1861	2093	2354	2648
31. Wood Working	947	1065	1198	1348
Other trades	14117	15879	17860	20089
Sub-Total of SSC & Dakhil (Voc.)	147,073	165430	186071	209291
4. National Skills Standard Basic				
1. Acting & Presentation	155	382	940	2315
2. Air Hostess & Cabin Crew	983	2421	5961	14679
3. Aminship (Surveyor)	3476	8560	21078	51905
4. Apparel Merchandising	2254	5550	13668	33658
5. Arc and Gas Welding	5309	13073	32193	79277
6. Arc Welding	5039	12409	30556	75245
7. AutoCAD	12550	30904	76103	187403
8. Auto-mechanics	5735	14122	34777	85638
9. Aviation Management	817	2012	4954	12200
10. Bamboo, Cane & Mat Industry	7939	19550	48142	118549

Trades/Occupations	Number of Graduates			
	2015 (Base Year)	2020	2025	2030
11. Building & Architectural Drafting with AutoCAD	5012	12342	30392	74842
12. Certificate in Pattern Making	1411	3475	8556	21070
13. Civil Construction	4919	12113	29829	73453
14. Computer Operation/Programming	568271	1399372	3445964	8485713
15. Database Programming	78730	193873	477414	1175637
16. Diesel Mechanics	3469	8542	21036	51801
17. Drafting Civil	1270	3127	7701	18964
18. Dress Making & Tailoring	75484	185880	457731	1127166
19. Electrical House Wiring	23675	58300	143564	353527
20. Food & Beverage Production/Service	4937	12157	29938	73722
21. Food Processing & Preservation	6385	15723	38718	95344
22. Furniture & Cabinet Making	2074	5107	12577	30970
23. General Electrician	6310	15538	38263	94224
24. General Mechanics	2461	6060	14923	36749
25. Graphics Design & Multimedia Programming	90064	221783	546143	1344882
26. Hair Dressing	17889	44052	108478	267128
27. Hardware & Networking	64533	158913	391325	963640
28. Housekeeping	13866	34145	84083	207054
29. Industrial Sewing Machine & Maintenance	6786	16711	41150	101332
30. Interior Decoration (Gypsum Decoration)	723	1780	4384	10796
31. Leather Goods & Footwear/Technology	4011	9877	24322	59894
32. Machinist	2264	5575	13729	33807
33. Maintenance of Electrical Equipment	2704	6659	16397	40378
34. Masonry and Rod Binding	3655	9000	22164	54578
35. Mobile Phone Servicing	21822	53737	132327	325857
36. Motor Cycle and Mishuk Mechanics	2598	6398	15754	38795
37. Pastry and Bakery Production	4536	11170	27506	67734
38. Plumbing & Pipe Fitting	7488	18439	45407	111815
39. Radio & Television Servicing	5397	13290	32727	80591
40. Refrigeration & Air Conditioning	13180	32456	79923	196810
41. Secretarial Science	5143	12665	31187	76798
42. Ship Fabrication	3169	7804	19217	47321
43. TIG & MIG Welding	1694	4171	10272	25296
44. Tiles Setting/Fitting	4425	10897	26833	66076
45. Travel, Tourism & Ticketing	2032	5004	12322	30343
46. Turner	1239	3051	7513	18501
47. Welding 4G	4550	11204	27591	67943
48. Welding 6G	4703	11581	28519	70228
49. Welding & Fabrication	15334	37760	92985	228975
50. Work Study Production Planning & Apparel Manufacturing	551	1357	3341	8228
51. Other trades	212236	522633	1286987	3169216
Sub-Total NSSB	1,345,257	3,312,704	8,157,564	20,088,067
GRAND TOTAL (All Streams)	1,743,325	3,818,745	8,810,183	20,942,145

Source: TVET Institution Census 2015, Micro-data.

Table-2.3 shows that at the prevailing trend rates of growth of TVET graduates in the BTEB approved institutions in the four TVET streams, the total supply of TVET graduates in the country will reach a high

of 8.8 million in 2025 (with 292,342 Diploma, 174,206 HSC Voc/BM, 186,071 SSC/Dakhil Voc and 8,157,564 NSSB) as well as 20.9 million in 2030 (with 432,737 Diploma, 212,050 HSC Voc/BM, 209,291 SSC/Dakhil Voc and 20,088,067 NSSB) indicating that it would more than double every five years, assuming that new entrants to the labor market other than TVET graduates cancel out the TVET graduates who do not enter the labor market. This is more likely to be the situation in the country because capacity building of the TVET institutions and especially NSSB courses are being generously supported by the donors and international development partners/agencies e.g. ADB, SDC and the World Bank. For a better projection of skills supply, TVET Institution Census, 2015 needs an updating in order to represent post-2015 scenario and latest developments in skills development of Bangladesh. In this context, mention can be made of the exemplary contribution of the SEIP of ADB.

Skills for Employment Investment Program (SEIP)

The Skills for Employment Investment Program (SEIP) was approved in 2014 as a multi-tranche financing facility to assist the GOB in expanding the national training capacity and industry-relevant quality training. The SEIP has financed a total of 500,000 trainees through Project 1 (260,000) and Project 2 (240,000), with a goal of placing at least 60 percent of new entrants in jobs (30% women among trainees). The Project 3 aims to train an additional 320,000 people. The SEIP also supported the establishment of the National Skills Development Authority (NSDA) to coordinate fragmented training systems in the public and private sectors and setting up the National Human Resource Development Fund (NHRDF) to provide a unified financial mechanism.

SEIP Project has established unique partnerships with public, private and nongovernment training agencies to deliver industry-responsive training across nine priority sectors. Tranche 1 (2014–2019) implemented training in six priority sectors through 11 industry associations, 34 public training institutes across three different ministries, Bangladesh Bank Small and Medium Enterprise Department (BB-SME), and Palli Karma-Sahayak Foundation (PKSF). Tranche 2 (2017–2021) expanded the scope of training with an additional three priority sectors and introduced industry-specific middle managerial training programs in collaboration with selected universities. SEIP Tranche-2 consisted of the four outputs: (i) Market responsive inclusive skills training delivered, (ii) Strengthening of Quality Assurance System, (iii) Strengthening of Institutions, and (iv) Monitoring and management for skills development strengthened. As regards output (i), as of 30 June 2020, 117,990 trainees have been certified out of whom 88,315 have been placed in job under T2. i.e. 74.85 percent. As many as 8,653 trainees had been enrolled for up-skilling training under Tranche-2 as of 30 June 2020. Out of 7,628 certified trainees 7,163 are currently in job (93.9%). As of 30 June 2020, special stipend has been paid to 25,243 trainees of whom 10,052 are women (39.82%). Achievements of output (ii) include the following: Out of 130 competency standards to be developed by SEIP Project, so far 87 have been developed under Tranche-1 and Tranche-2. SEIP has developed 60 competency-based learning materials and 87 assessment tools as well. SEIP is continuing the development of additional learning materials and guidelines, in consultation with the industry experts. SEIP also provides training of trainers, including training of master trainers in coordination with overseas institutes (e.g. The Institute of Technical Education Singapore and Nanyang Polytechnic International). These programs have started under Tranche-1 and are continuing under Tranche-2. Output (iii) includes the following: (a) NSDA bill was passed by the Bangladesh Parliament on 18 September 2018 and the Cabinet of Bangladesh approved the “policy for proper use of NHRD” on 04 November 2019. Detailed operational plan including organizational structure has been prepared and guidelines for training institute/center registration, course accreditation, trainee & assessor assessment also been developed for operating of NSDA. The MOU has been signed among SEIP, BMET and KOICA for modernization of 3 TTCs. The infrastructure upgrading will be supported by SEIP, whereas implementation of upgraded training courses and training of trainers will be supported by KOICA. The design supervision consultants (DSC) has been recruited and DSC has started the detailed design works since March 2020. A coordination meeting was held on 12 March 2020 to make effective coordination

among the stakeholders. In output (iv), one tracer study of SEIP graduates has been completed and another is underway. The Tranche 3 (2020–2023) has added training for renewable energy subsector and incorporate selected new advanced skills training courses, while strengthening the established partnerships to impart entry- and mid-level skills training.

SEIP supported the GOB's reforms in skills development, anchored in the NSDP 2011. The overall objective of the SEIP is to qualitatively and quantitatively expand the skilling capacity of identified public and private training providers by establishing and operationalizing a responsive skills ecosystem and delivery mechanism through a combination of well-defined set of funding triggers and targeted capacity support. It supported the GOB's ambitious skills development initiatives (2017-2021), which aimed to enhance the productivity and employability of the growing workforce to reduce poverty and accelerate economic growth as well as to harness the evolving skills development system by strengthening training partnerships established in Tranche-1, while expanding the scope of skills training. Horizontally, this has expanded its sectoral coverage of training from six priority industries (readymade garment and textile, leather and footwear, construction, light engineering, information technology, and shipping) to ten priority industries (readymade garments & textiles, leather goods, construction, information technology, light engineering, shipbuilding, agro-processing, tourism & hospitality, caregiving, renewable energy), bringing in additional public and private training partners, and pilot up-skilling training for Bangladesh migrant workers overseas. It continues to support large-scale private sector involvement and public-private partnership (PPP), which is critical to meet existing and future labor market needs and to reduce skills gap. This in turn is crucial for Bangladesh to move away from the 'low-skill, low-wage equilibrium' to a 'higher skill, higher wage virtuous cycle' to become an upper middle-income country in 2031. This investment program helps the GOB scale-up skilling of new entrants and up-skilling of existing workers to contribute to higher growth of priority sectors. It strengthens skills development in Bangladesh by establishing a unified funding system (NHRDF) and enhancing overall coordination of the currently fragmented system through the NSDA. SEIP Tranche-3 (2020-2023) aims to harness and institutionalize training partnerships established under Tranches-1 and Tranche-2. It continues to support sector-focused job-ready skills training through the existing partnerships with public institutes, industry associations and other organizations, covering skills requirements in ten industry sectors. It has introduced selected advanced courses to adopt and adapt emerging Industry 4.0 skill requirements and help industries move up the value chain. It will also support new training specifically targeted at socially disadvantaged groups (including people with disabilities) and women entrepreneurs to ensure inclusive skilling efforts. Overall, Tranche-3 will train about 320,000 people, 30 percent of whom will be women. Thus SEIP is supporting the skills supply landscape through public and private skills training providers and industry-based training centers in Bangladesh to justify the rationale for investment in future skills areas with expanded supply capacity and to substantiate the value of the investment by the government. ADB is looking at how it can best assist the government (SEIP Website). Table-2.4 presents SEIP industry-based training statistics as of 20 June 2021. It reveals that SEIP skills training programs covers the trades of thrust industry sectors including the thriving service industries. SEIP has introduced market responsive skills training program. More importantly, job placement rate of SEIP skills training programs is phenomenal averaging 71.28 percent with the highest in the case of BTMA industries (96.42%).

Table-2.4: SEIP industry-based training statistics as of 20 June 2021

SL.	Industry Association/ Organization	Total Target	Enrollment	Certification	Job Placement	Dropout	% of Job Placement
1	AEOSIB – Association of Export Oriented Shipbuilding Industries of Bangladesh	7,565	7,328	6,164	4,786	65	77.64
2	BACCO – Bangladesh Association of Call Center & Outsourcing	5,785	5,785	5,645	3,747	78	66.38

Table-2.4: SEIP industry-based training statistics as of 20 June 2021

SL.	Industry Association/ Organization	Total Target	Enrollment	Certification	Job Placement	Dropout	% of Job Placement
3	BACI – Bangladesh Association of Construction Industry	13,110	13,110	12,700	9,957	349	78.40
4	BASIS – Bangladesh Association of Software & Information Services	23,000	23,000	22,979	15,013	20	65.33
5	BBSME – Bangladesh Bank SME	10,964	10,884	10,664	8,010	107	75.11
6	BEIOA – Bangladesh Engineering Industry Owners Association	8,340	8,354	8,185	6,933	143	84.70
7	BGMEA – Bangladesh Garment Manufacturers & Exporters Association	42,315	40,148	39,423	28,815	624	73.09
8	BITAC – Bangladesh Industrial Technical Assistance Center	3,240	3,275	2,894	2,326	297	80.37
9	BKMEA – Bangladesh Knitwear Manufacturers & Exporters Association	23,971	23,980	23,411	21,492	474	91.80
10	BMET – Bureau of Manpower Employment & Training	44,460	43,775	39,218	22,486	2,502	57.34
11	BRTC – Bangladesh Road Transport Corporation	14,700	12,939	12,442	-	264	-
12	BTMA – Bangladesh Textile Mills Association	31,500	31,500	30,821	29,719	493	96.42
13	BWCCI – Bangladesh Women Chamber of Commerce & Industry	1,100	1,100	1,086	772	9	71.09
14	DTE – Directorate of Technical Education	13,560	13,272	10,928	5,453	932	49.90
15	LFMEAB – Leather Goods & Footwear Manufacturers and Exporters Association of Bangladesh	4,860	4,860	4,592	4,394	199	95.69
16	PKSF – Palli Karma Sahayak Foundation	10,000	10,011	9,882	7,916	91	80.11
	Total	258,470	253,321	241,034	171,819	6,647	71.28
Source: SEIP Website.							

SEIP is developing a lot of trained workers for most of the major manufacturing sectors following the competency standards agreed by both the industrialists and SEIP, but the market cannot absorb all of them. As reported by the SEIP officials, about 40 percent of the trained graduates remain unemployed with their obtained skills. Besides, SEIP is implementing an Executive Development Program at four renowned universities in Bangladesh to produce high-quality mid-level managers for major industry sectors. This program is expected to reduce the demand for foreign managers in the future. SEIP has also arranged international assessment and certification for some of its courses that help to improve the quality of skills training and job prospects.

According to BIDS survey of TVET institutions, existing Diploma trades which are most in demand, both domestically and internationally, include: civil, computer, electrical and mechanical. Among other trades mention can be made of medical, dental, automobile, electronics, laboratory, pharmacy, physiotherapy and power. New Diploma trades which have promising future market demand include, in addition to the existing ones, architecture, marine and electro-medical. None of the Diploma institutions plans to add any new trade in the immediate future (Annex-2: Table-1.23a).

Existing HSC (Vocational) trades which are most in demand, both domestically and internationally, include: electronic control & communication, auto mobile/automotive, computer operation & maintenance, electrical works & maintenance and welding & fabrication. Among other trades mention can be made of clothing & garments finishing, machine tools operation & maintenance and yarn & fabric

manufacturing. New HSC (Vocational) trades which have promising future market demand include the existing ones and beyond (not specified). None of the HSC (Vocational) institutions plans to add any new trade in the foreseeable future (Annex-2: Table-1.23b).

Existing SSC/Dakhil (Vocational) trades which are most in demand, both domestically and internationally, include in order of importance the following: computer & information technology, general electrical works, general mechanics, general electronics, civil construction, automotive, building maintenance, dress making, food processing & preservation, electrical maintenance works and refrigeration & air conditioning. Among other trades mention can be made of agro-based food, mechanical drafting with CAD, glass, welding & fabrication, and poultry rearing & farming. New SSC/Dakhil (Vocational) trades which have promising future market demand include the existing ones plus plumbing & pipe fitting, poultry rearing & farming, architectural drafting with CAD, dyeing-printing & finishing, farm machinery, machine tools operation and mechanical drafting with CAD. None of the SSC/Dakhil (Voc) institutions plans to add any new trade in the immediate future (Annex-2: Table-1.23c).

Existing NSSB trades which are most in demand, both domestically and internationally, include in order of importance the following: computer operation & programming, graphics design & multimedia programming, database programming, hardware & networking, autoCAD, electrical house wiring and general electrician. Among other trades mention can be made of dress making & tailoring, mobile phone servicing, aminship, automechanics, general mechanics and food processing & preservation. New NSSB trades which have promising future market demand are the same as the existing ones. None of the NSSB institutions plans to add any new trade in the foreseeable future (Annex-2: Table-1.23d).

BIDS survey further finds that according to the Diploma graduates, all the Diploma students of ceramics, chemical, civil, electronics, environmental, instrumentation & process control, fisheries, garments design & pattern making, jute, laboratory, marine, mechanical, medical, patient care and pharmacy trades get job immediately after graduation (Annex-2: Table-2.7). HSC (Voc) graduates perceive that there is 100 percent demand of jobs in automobile, computer operation & maintenance, electrical works & maintenance, and electronic control & communication trades (Annex-2: Table-2.8). SSC/Dakhil (Voc) graduates perceive that there exists highest demand of jobs in civil construction, civil drafting with CAD, electrical maintenance works and poultry rearing & farming followed in order by general mechanics, general electrical works and computer & information technology (Annex-2: Table-2.9). In the case of NSSB trades, 100 percent students of apparel merchandising, auto mechanics, database programming, dress making & tailoring, food & beverage production/service, general electrician, hardware & networking, machinist, maintenance of electrical equipment, mobile phone servicing, refrigeration & air conditioning, tiles setting & fitting, welding & fabrication are believed to get job immediately after graduation (Annex-2: Table-2.10).

BIDS survey further reveals that the job expectations of Diploma students is the highest in architecture, automobile, computer, electrical, electronics, laboratory, mechanical, medical, patient care, pharmacy, power, printing & graphics design and other related trades. Diploma students believe that students of these trades get job immediately after graduation (Annex-2: Table-3.9). HSC (Voc) students have the highest job expectations in clothing & garments finishing, computer operation & maintenance, electrical works & maintenance, electronic control & communication, and refrigeration & air conditioning (Annex-2: Table-3.10). According to SSC/Dakhil (Voc) students, 100 percent of the students in agro-based food, electrical maintenance works, machine tools operation, patient care technique and poultry rearing & farming trades get job immediately after graduation (Annex-2: Table-3.11). Next in importance are general electronics (92.9%), general electrical works (86.1%), computer & information technology (83.3%), and general mechanics (81.8%). According to NSSB students, all the students of arc & gas welding, auto mechanics, database programming, dress making & tailoring, general electrician, graphics design & multimedia programming, housekeeping, maintenance of electrical equipment, masonry & rod

binding, mobile phone servicing, plumbing & pipe fitting, refrigeration & air conditioning, tiles setting & fitting, welding 4g, and other related trades get job immediately after graduation (Annex-2: Table-3.12).

II.4 Impact of COVID-19 on TVET Institutions in 2020

According to BIDS survey, the impact of COVID-19 on TVET institutions in 2020 was widespread (Annex-2: Table-1.26). Average number of days TVET institutions were closed was as high as 118 days (excluding weekly & Government holidays). It means that six working months were lost. Main reason for the closure of the TVET institutions was Government lockdown (80.7%) followed by institution authority's decision not to open the institution in consideration of health risk. Poor attendance of the students mattered very little. The most important ramification/form of the impact of COVID-19 was financial loss of the institutions (41.3%) followed by lockout/closure of the institutions (28.4%), reduction in the salary of the employees (14.8%) and apprenticeship could not be provided due to non-existence of correspondence with other institutions (9%). Though negligible, firing/retranchment of the staff/employees and reduction of fringe benefits were also reported. The way financial loss incurred was adjusted/will be adjusted varies widely. The most important source of adjustment is borrowing from others (31%) followed by reduction in office expenses (22.6%), reduction in availing opportunities (19.4%) and Government assistance (14.2%).

II.5 Fourth Industrial Revolution and the Future of Jobs and Skills

We are at the threshold of the Fourth Industrial Revolution (also known as Industry 4.0 or 4IR) that will fundamentally alter the way we live, work, and relate to one another. Now the Fourth Industrial Revolution (4IR) is building on the 3IR, the digital revolution that has been occurring since the middle of the last century. The 4IR can be described as the advent of “cyber-physical systems” involving entirely new capabilities for people and machines. While these capabilities are reliant on the technologies and infrastructure of the 3IR, the 4IR represents entirely new ways in which technology becomes embedded within societies and even human bodies. It is a convergence of the digital, physical and biological spheres. The 4IR upends current economic frameworks. It is a fusion of advances in artificial intelligence (AI), robotics, the Internet of Things (IOT), 3D printing, genetic engineering, quantum computing, and other technologies. It is the collective force behind many products and services that are fast becoming indispensable to modern life. Table-2.4 shows a short presentation of the industrial revolutions from 1760 to the present.

Table-2.4: Main characteristics of industrial revolutions

IR	Period	Transition Period	Energy Resource	Main Technical Achievement	Main Developed Industries	Transport Means
1	1760-1900	1860-1900 (Late 18 th – Early 19 th Century)	Coal	Steam Engine (Mechanization: Machines replace animal & manual labor)	Textile, Steel	Train
2	1900-1960	1940-1960 (Late 19 th –Mid 20 th Century)	Oil Electricity	Internal Combustion Engine (Mass Production: Mass manufacturing, machines & processes)	Metallurgy, Auto, Machine Building	Train, Car
3	1960-2000	1980-2000 (Second half of 20 th Century– Early 21 st Century)	Nuclear Energy, Natural Gas	Computers, Robots (Digital Revolution & Globalization: Analog to digital technology, Internet &	Auto, Chemistry	Car, Plane

Table-2.4: Main characteristics of industrial revolutions						
IR	Period	Transition Period	Energy Resource	Main Technical Achievement	Main Developed Industries	Transport Means
				Worldwide Web, globalization)		
4	2000-	2000-2010 (Early 21 st Century-?)	Green Energies	Internet, 3D Printer, Genetic Engineering (Automation, Analytics and IOT : Cyber-physical devices, analytics & IOT)	High Tech Industries	Electric Car, Ultra-Fast Train
Source: Adapted from Prisecaru, P. (2016). "Challenges of the Fourth Industrial Revolution." Knowledge Horizons. Economics, 8(1), 57-62. Web https://search-proquest-com.ezproxy.libraries.udmercy.edu:2443/docview/1793552558?accountid=28018 .						

The easiest way to understand the 4IR is to focus on the technologies driving it. These include the following (WEF Website):

(1) Artificial intelligence (AI) describes computers that can “think” like humans – recognizing complex patterns, processing information, drawing conclusions, and making recommendations. AI is used in many ways, from spotting patterns in huge piles of unstructured data to powering the autocorrect on phone.

(2) Blockchain is a secure, decentralized, and transparent way of recording and sharing data, with no need to rely on third-party intermediaries. The digital currency Bitcoin is the best known blockchain application. However, the technology can be used in other ways, including making supply chains traceable, securing sensitive medical data anonymously, and combating voter fraud.

(3) New computational technologies are making computers smarter. They enable computers to process vast amounts of data faster than ever before, while the advent of the “cloud” has allowed businesses to safely store and access their information from anywhere with internet access, at any time. Quantum computing technologies now in development will eventually make computers millions of times more powerful. These computers will have the potential to supercharge AI, create highly complex data models in seconds, and speed up the discovery of new materials.

(4) Virtual reality (VR) offers immersive digital experiences (using a VR headset) that simulate the real world, while augmented reality merges the digital and physical worlds.

(5) Biotechnology harnesses cellular and biomolecular processes to develop new technologies and products for a range of uses, including developing new pharmaceuticals and materials, more efficient industrial manufacturing processes, and cleaner, more efficient energy sources.

(i) Robotics refers to the design, manufacture, and use of robots for personal and commercial use. While we are yet to see robot assistants in every home, technological advances have made robots increasingly complex and sophisticated. They are used in fields as wide-ranging as manufacturing, health and safety, and human assistance.

(ii) 3D printing allows manufacturing businesses to print their own parts, with less tooling, at a lower cost, and faster than via traditional processes. Plus, designs can be customized to ensure a perfect fit.

(iii) Innovative materials, including plastics, metal alloys, and biomaterials, promise to shake up sectors including manufacturing, renewable energy, construction, and healthcare.

(iv) The IOT describes the idea of everyday items – from medical wearables that monitor users’ physical condition to cars and tracking devices inserted into parcels – being connected to the internet and identifiable by other devices.

(v) Energy capture, storage, and transmission represent a growing market sector, spurred by the falling cost of renewable energy technologies and improvements in battery storage capacity.

The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge, are unlimited; and these possibilities will be multiplied by emerging technology breakthroughs in fields e.g. AI, robotics, the IOT, autonomous vehicles, 3D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing. Already, AI is all around us, from self-driving cars and drones to virtual assistants and software that translate or invest. Impressive progress has been made in AI in recent years, driven by exponential increases in computing power and by the availability of vast amounts of data, from software used to discover new drugs to algorithms used to predict our cultural interests.

In high-income countries, the demand for highly skilled workers has increased while the demand for workers with less education and lower skills has decreased. The result is a job market with a strong demand at the high and low ends, but a hollowing out of the middle. On the supply side, many industries are seeing the introduction of new technologies that create entirely new ways of serving existing needs and significantly disrupt existing industry value chains. Disruption is also flowing from agile, innovative competitors who, thanks to access to global digital platforms for research, development, marketing, sales and distribution, can oust well-established incumbents faster than ever by improving the quality, speed, or price at which value is delivered.

Future Jobs

The 4IR may affect inequality across economies as well as within them. In particular, the increasing flexibility of capital in the form of robots and other advanced manufacturing systems may erode the comparative advantage currently enjoyed by many emerging and developing countries, which are focused on labor-intensive goods and services. The phenomenon of “re-shoring” could have a particularly negative effect on those least developed economies just beginning to industrialize as they integrate into the global economy.

From intelligent robots and self-driving cars to gene editing and 3D printing, dramatic technological change is happening at lightning speed all around us. Despite the anticipated disruption and uncertainty of workers of nearly all skills levels, one thing remains clear: Workers are increasingly turning to alternative work arrangements like side hustles, freelancing, independent contracting and gigging. In monetary terms, the size of the world’s gig economy exceeds \$200 billion in gross volume, an amount that is expected to more than double to approximately \$455 billion by 2023. The majority (more than 75%) of those currently generating income through alternative work arrangements do so by choice. For 86 percent of females in the gig economy, freelancing provides more than an opportunity to make a living- it is an opportunity to receive equal pay (WEF, 2019).

What is fuelling the global gig economy³?

A host of factors contribute to the rise of the gig economy, including increased globalization, advancements in technology and static educational and institutional inertia that cannot keep pace with changing workforce demands. It is not only the alternative workforce that is impacted by these factors. Workers in every industry- women and men- will experience the transformation brought about by the 4IR, if they have not already. Approximately 50 percent of companies worldwide predict that automation will trim their current full-time workforce by 2022 and, by the same year, researchers expect at least 54 percent of employees will need re-skilling and up-skilling to complete their jobs.

More surprisingly, automation will replace 11 percent of the female labor force but only 9 percent of the male labor force over the next two decades. The explanation is simple: despite their making up less than half of the global labor force, many jobs often held by women (secretaries, cashiers, and fast-food workers) are 70 percent more likely to be replaced by automation. These data contrast narratives put forth by the media that tend to portray technology and robots as overtaking “men’s work” (Sheikh, 2020).

In addition to “high risk” jobs, high paying jobs in technology are leaving women behind in the future of work. ICT specialists are four times more likely to be male than female, and only 24 percent of ICT graduates in 2015 were women. An analysis of companies working with open-source software, for example, found that only 15 percent of their software authors are women. Women are the majority of university students in 50 percent of the world’s countries at a time when we are experiencing a global labor force shortage of 40 million workers (WEF, 2019).

Nowhere is the upheaval of the 4IR more likely to be felt than the workplace. As with previous industrial revolutions, the 4IR will profoundly affect people’s lives as AI and increased automation see many types of jobs disappear. Computers and automation will come “together in an entirely new way, with robotics connected remotely to computer systems equipped with machine-learning algorithms that can learn and control the robotics with very little input from human operators.” “Industry 4.0 introduces what has been called the ‘smart factory,’ in which cyber-physical systems monitor the physical processes of the factory and make decentralized decisions.” (Marr, 2016). At the same time, entirely new categories of jobs are emerging.

We have to understand the two competing effects that technology exercises on employment. First, there is a destruction effect as technology-fuelled disruption and automation substitute capital for labor, forcing workers to become unemployed or to reallocate their skills elsewhere. Second, this destruction effect is accompanied by a capitalization effect in which the demand for new goods and services increases and leads to the creation of new occupations, businesses and even industries. There are roughly two opposing camps when it comes to the impact of emerging technologies on the labor market: those who believe in a happy ending – in which workers displaced by technology will find new jobs, and where technology will unleash a new era of prosperity; and those who believe it will lead to a progressive social and political Armageddon by creating technological unemployment on a massive scale. History shows that the outcome is likely to be somewhere in the middle.

Labor substitution

Frey & Osborne (2013) have quantified the potential effect of technological innovation on unemployment by ranking 702 different professions according to their probability of being automated, from the least susceptible to the risk of automation (“0” corresponding to no risk at all) to those that are the most

³Gig economy is a labor market characterized by the prevalence of short-term contracts or freelance work as opposed to permanent jobs.

susceptible to the risk (“1” corresponding to a certain risk of the job being replaced by a computer of some sort). Table-2.5 highlights certain professions that are most likely to be automated, and those least likely.

This research concludes that about 47 percent of total employment in the US is at risk, perhaps over the next decade or two, characterized by a much broader scope of job destruction at a much faster pace than labor market shifts experienced in previous industrial revolutions. In addition, the trend is towards greater polarization in the labor market. Employment will grow in high-income cognitive and creative jobs and low-income manual occupations, but it will greatly diminish for middle-income routine and repetitive jobs.

Professions most prone to automation		Professions least prone to automation	
Profession	Probability	Profession	Probability
Telemarketers	0.99	Mental Health and Substance Abuse Social Workers	0.0031
Tax preparers	0.99	Choreographers	0.0040
Insurance Appraisers, Auto Damage	0.98	Physicians and Surgeons	0.0042
Umpires, Referees, and Other Sports Officials	0.98	Psychologists	0.0043
Legal Secretaries	0.98	Human Resources Managers	0.0055
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	0.97	Computer Systems Analysts	0.0065
Real Estate Brokers	0.97	Anthropologists and Archeologists	0.0077
Farm Labour Contractors	0.97	Marine Engineers and Naval Architects	0.0100
Secretaries and Administrative Assistants, Except Legal, Medical & Executive	0.96	Sales Managers	0.0130
Couriers and Messengers	0.94	Chief Executives	0.0150

Source: Carl Benedikt Frey and Michael Osborne, University of Oxford, 2013, Quoted in Schwab, 2016.

It is interesting to note that it is not only the increasing abilities of algorithms, robots and other forms of non-human assets that are driving this substitution. Michael Osborne observes that a critical enabling factor for automation is the fact that companies have worked hard to define better and simplify jobs in recent years as part of their efforts to outsource, off-shore and allow them to be performed as “digital work” (such as via Amazon’s Mechanical Turk, or MTurk, service, a crowd-sourcing internet marketplace). This job simplification means that algorithms are better able to replace humans. Discrete, well-defined tasks lead to better monitoring and more high-quality data around the task, thereby creating a better base from which algorithms can be designed to do the work.

As Frey and Osborne’s work shows, it is almost inevitable that the 4IR will have a major impact on labor markets and workplaces around the world. But this does not mean that we face a man-versus-machine dilemma. In fact, in the vast majority of cases, the fusion of digital, physical and biological technologies driving the current changes will serve to enhance human labor and cognition, meaning that leaders need to prepare workforces and develop education models to work with, and alongside, increasingly capable, connected and intelligent machines. This is the new on-demand economy, where providers of labor are no longer employees in the traditional sense but rather independent workers who perform specific tasks.

The challenge we face is to come up with new forms of social and employment contracts that suit the changing workforce and the evolving nature of work. We must limit the downside of the human cloud in terms of possible exploitation, while neither curtailing the growth of the labor market nor preventing people from working in the manner they choose. If we are unable to do this, the 4IR could lead to increasing levels of fragmentation, isolation and exclusion.

One challenging scenario for low-income countries is if the 4IR leads to significant “re-shoring” of global manufacturing to advanced economies, something very possible if access to low-cost labor no longer drives the competitiveness of firms. If this pathway closes, many countries will have to rethink their models and strategies of industrialization. Whether and how developing economies can leverage the opportunities of the 4IR is a matter of profound importance to the world; it is essential that further research and thinking be undertaken to understand, develop and adapt the strategies required.

The 4IR is already in full force in the Third World countries. The leading industries being labor-intensive in these countries, there is a high risk of automation that will leave hundreds of thousands of people unemployed. RMG is an industry highly prone to automation. Similarly, back office, skilled administrative workers may also be at risk through the increasing adoption of robotic process automation and AI. The answer has to lie in an aggressive but strategic adoption of technology while ensuring that the current and future workforce is adequately prepared for the demands of this rapidly changing environment.

The 4IR is largely driven by four specific technological developments: high-speed mobile Internet, AI and automation, the use of big data analytics, and cloud technology. Of these four technologies, AI and automation are expected to have the most significant impact on employment figures within the global workforce. A recent study released by McKinsey Global Institute (2017) reports that roughly one-fifth of the global workforce will be impacted by the adoption of AI and automation, with the most significant impact in developed nations like the UK, Germany and USA. By 2022, 50 percent of companies believe that automation will decrease their numbers of full-time staff and by 2030, robots will replace 800 million workers across the world.

The 4IR will impact nearly every industry with The Economist predicting that 50 percent of jobs are vulnerable to automation. However, some industries are more likely to be automated than others as robots, like human employees, have a particular specific skills set. Within the near future, we can expect to see a reduction in the number of full-time staff in manufacturing and agricultural roles as many of these positions are already being phased out due to increased automation. Robots can also more effectively and safely handle tasks within industrial plants. Notably, their use in manufacturing dates back as early as the 1970s. These scenarios represent a change within the workforce and the need for employees to adjust skills sets to take on more beneficial roles.

The OECD released a list showing the likelihood of roles, within specific industries, becoming obsolete or automated. At the top of the list are occupations within food preparation, construction, cleaning, driving and agricultural sectors. In addition to manufacturing roles, automation may also impact postal and courier services, shipping and delivery and service industry jobs. BBC has put together a handy calculator to help us determine how likely it is that a robot will replace workforce.

With rapid advancements in technologies e.g. automation and AI, the 4IR is changing the way we live, work and think. The rise of automation will require numerous individuals to adopt new skills, both IT and non-IT related, in order to remain employable. The future of work belongs to those with emotional and social intelligence, who can spend more time on creative, collaborative, and complex problem-solving tasks that machine automation is not suited to handle.

The World Economic Forum’s “Future of Jobs” report found that 35 percent of core skills will change between 2015 and 2020. As the pace of technological change quickens, it is the responsibility of employers to empower and educate their workforce to keep up with the pace of change. It is already evident that talent development, lifelong learning and career reinvention are critical for the future workforce.

In 2013 Frey and Osborne investigated 702 detailed occupations and their probability to be substituted by computerization (Frey & Osborne, 2013). Based on this study and further findings, Table-2.6 highlights the main jobs that are of high risk of substitution, as well as future jobs that offer great opportunities in several industries.

Table-2.6: Jobs at high risk vs. future jobs	
Jobs at high risk	Future jobs
<ul style="list-style-type: none"> • Cargo and Freight Agents • Bookkeeping, Accounting, Auditing Clerks • Administrative occupations (e. g. Order and Procurement Clerks) • Office Clerks (e.g. Telephone Operators, Postal Service) • Paralegals and Legal Assistants 	<ul style="list-style-type: none"> • Human Resource Managers • Marketing and International Sales Managers • Database Administrators • Computer and Information Systems Manager/Administrators • International Consultants • Training and Development Managers • Computer System Analysts • Industrial-Organizational Psychologists • Data Scientists/Analysts • Social Media Managers Network and Computer Systems Administrators
Source: Frey & Osborne, 2013. Quoted from Eberhard et al. (2017).	

Due to the computerization and other trends, the employment market is facing drastic changes; jobs will become obsolete and new work places that require new skills sets will be established. TVET institutions need to prepare students to be able to work not just in one industry, but to give students knowledge about the processes in different industries.

Additionally, by using modern ICT and by developing the speed of the internet, manufacturing companies will be able to create real-time communication and connectivity with worldwide subsidiaries. All the mentioned facts result in totally new workforce requirements. Jobs at high risk and future jobs related to the industry sector are summarized in Table-2.7. Equipment assemblers, all kind of production workers, as well as automotive repairers and car dealers are assumed to be at high risk of substitution, whereas there is a great need for production supervisors, controllers and planners, as well as all kind of engineers in the future (Frey & Osborne, 2013).

Table-2.7: Future Jobs	
Jobs at high risk	Future jobs
<p>General:</p> <ul style="list-style-type: none"> • Cargo and Freight Agents • Bookkeeping, Accounting, Auditing Clerks • Administrative occupations (Order & Procurement clerks, ...) • Office Clerks (Telephone operators, postal service, ...) • Paralegals and Legal Assistants 	<ul style="list-style-type: none"> • Human Resource Managers • Marketing and International Sales Managers • Database Administrators • Computer and Information Systems Manager/Administrators • International Consultants • Training and Development Managers • Computer System Analysts • Industrial-Organizational Psychologists • Data scientist/analyst • Social Media Managers • Network and Computer Systems Administrators

Table-2.7: Future Jobs

Jobs at high risk	Future jobs
<p>Industrial sector:</p> <ul style="list-style-type: none"> • Equipment Assemblers • Operating Engineers & other construction equipment operators • All kind of production workers • Automotive Body and Related Repairers /Car dealerships 	<ul style="list-style-type: none"> • Production Supervisors, Controller, Planners • Mechanical/Industrial Engineers • Material Scientist/Engineers • Electronical and Electrical Engineers
<p>Banking and finance:</p> <ul style="list-style-type: none"> • Loan Officers • Receptionists and Information clerks • Personal Financial Advisors 	<ul style="list-style-type: none"> • User experience designer • Behavioral psychologist • Algorithmic risk specialist • Community builder • Telematic specialists
<p>Insurance:</p> <ul style="list-style-type: none"> • Personal Insurance Advisors 	<ul style="list-style-type: none"> • Risk Analysts (for investments) • Reputation builders/ Image improvers • Cyber insurance provider
<p>Commerce:</p> <ul style="list-style-type: none"> • Retail Salespeople • Telemarketers • Library Technicians 	<ul style="list-style-type: none"> • User experience specialists • Virtual shopping advisors
<p>Transport and traffic:</p> <ul style="list-style-type: none"> • Cargo & freight Agents/Postal service Mail sorters • Packaging & Filling Machine Operators & Tenders • Shipping, Receiving and Traffic Clerks • Procurement Clerks, Billing and Posting Clerks • Counter and Rental Clerks • Couriers and Messengers • Traffic Technicians • Taxi Drivers and Chauffeurs • Bus Drivers, Train Drivers. 	<ul style="list-style-type: none"> • Air traffic controllers
<p>Information and Consulting:</p>	<ul style="list-style-type: none"> • Software, System Developers • Commercial and Industrial Designers • Statisticians • Survey researchers • Management/ Business Analysts • Training and Development Managers • Financial Analysts
<p>Tourism, Health and Hospitality:</p> <ul style="list-style-type: none"> • Hosts and Hostesses, Restaurant, Lounge and Coffee Shop • Telephone Operators • Chefs, Cooks, Restaurants • Postal Service Clerks • Hotel, Motel and Resort Desk Clerks • Waiters and Waitresses • Bartenders • Travel Agents • Receptionist 	<ul style="list-style-type: none"> • Recreational Therapists • Mental Health and Healthcare Workers • Social Workers • Dietitians and Nutritionists • Physicians and Surgeons • Psychologists (all kinds) • Nurses • Marketing and sales operator/ PR manager/Branding • Tourism destination planner • Strategic sales and channel manager • Community manager • Cultural manager • Innovation manager

Jobs at high risk	Future jobs
<ul style="list-style-type: none"> • Entrepreneurship a. green jobs: 	<ul style="list-style-type: none"> • Green Entrepreneurs • Social Entrepreneurs • Environmental scientists and consultants • Agricultural engineers • Climatologist, • Bioinformatics • Archeologist
<ul style="list-style-type: none"> • Others: 	<ul style="list-style-type: none"> • Teachers all kind • Medical Scientists • Clinical, Counseling and School Psychologists • Educational, Guidance, School & Vocational Counselors • Career/Technical Education Teachers • Marriage & Family Therapists

Source: Frey & Osborne, 2013. Quoted from Eberhard et al. (2017).

As Brynjolfsson & McAfee (2014) have pointed out, 4IR could yield greater inequality, particularly in its potential to disrupt labor markets. As automation substitutes for labor across the entire economy, the net displacement of workers (and deskilling) by machines might exacerbate the gap between returns to capital and returns to labor. On the other hand, it is also possible that the displacement of workers by technology will, in aggregate, result in a net increase in safe and rewarding jobs.

The 4IR is therefore not a prediction of the future but a call to action. It is a vision for developing, diffusing, and governing technologies in ways that foster a more empowering, collaborative, and sustainable foundation for social and economic development, built around shared values of the common good, human dignity, and intergenerational stewardship. Realizing this vision will be the core challenge and great responsibility of the next 50 years.

By and large, automation will transform our work, our lives and our society. Whether the outcome is inclusive or exclusive, fair or *laissez-faire*, is up to us. Getting this right is among the most important and inspiring challenges of our time. It should be a priority for everyone who hopes to enjoy the benefits of a healthy and stable society; one that offers opportunity for all.

Future Skills

The Challenge: Shifts in Labor Demand

The 4IR is creating demand for millions of new jobs, with vast new opportunities for fulfilling people’s potential and aspirations. Yet, at present, the dominant public narrative remains one of unequal opportunity, job displacement and widening income inequality. In the job market, while 133 million new roles may be created by the 4IR, 75 million jobs may be displaced by these new technologies at the same time. In education systems, if current trends continue, even those in schooling will continue to lack the skills necessary for the future of work. By 2022, on average, workers will need 101 days of additional learning to prepare for the future needs of their job and up to US\$11.5 trillion could be added to global GDP by 2028 if workers were better prepared to leverage the opportunities of the 4IR. To prepare for the new world of work, companies need to take urgent and targeted action to address the skills gap as inaction will prove a significant competitive liability in the future. Investing in life-long employability of their workers to secure access to future skills will provide companies with a distinct competitive advantage, boost their productivity, and improve their resilience in a fast-changing world (WEF, 2020).

As the 4IR reshapes the future of work, businesses must prepare their people for the new world that lies ahead. This often means an increased focus on continual learning, building more on-ramps to new types of jobs, and a commitment to diversity. Businesses will need to ensure they have the right mix of skills in their workforce to keep pace with the changing technology. It is believed that AI will impact the types of skills the companies need. Workers will more than likely need to update their skills, not just once but many times throughout their careers. Just as traditional jobs are quickly being redefined in today's market, our systems of learning need to adapt to address the rising demand for soft skills and the increasingly diminishing lifespan of hard skills⁴ (D2L, 2019).

Businesses and governments need to share responsibility for up-skilling the workers. In the 4IR, it will be important to creating nontraditional pathways for building skills. It is imperative that businesses build their capacity to innovate and be agile. There is a pressing need to build a holistic solution. Companies need to be thinking about enabling their employees to both code in new coding languages, but also to change their mix of soft skills. As AI begins to impact the workforce and automation replaces some existing skills, there is an increased need for emotional intelligence, creativity and critical thinking. Talent development and up-skilling are going to be ever-increasingly critical, especially to those working in industries most prone to automation by new technologies, older and lower-income cohorts.

Two sets of strategies seem reasonable in order to prepare ourselves for these shifts. The first is to invest in building and developing skills linked to science, technology and design so that we equip the world with people able to work alongside ever-smarter machines, thus being augmented rather than replaced by technology. The second strategy is to focus more on those qualities that make us uniquely human rather than machines – in particular traits such as empathy, inspiration, belonging, creativity and sensitivity. In this way we can reinforce and highlight essential sources of the value created by and within communities that is often completely overlooked in economic measurement – the act of caring for one another.

The scarcest and most valuable resource in an era driven by digital technologies will be neither ordinary labor nor ordinary capital; rather it will be those people who can create new ideas and innovations. In the future, talent, more than capital, will represent the critical factor of production. People with ideas, not workers or investors, will be the scarcest resource (Brynjolfsson, McAfee and Spence, 2014). The quest for talent will give rise to a job market that may become increasingly segregated. Low skilled and low wage jobs will be replaced by computers and digitization. The higher paid jobs requiring more skills are less likely to be replaced. This increased dichotomization can lead to an increase in social tensions.

In the foreseeable future, low-risk jobs in terms of automation will be those that require social and creative skills; in particular, decision-making under uncertainty and the development of novel ideas. This, however, may not last. Sophisticated algorithms can create narratives in any style appropriate to a particular audience. In such a rapidly evolving working environment, the ability to anticipate future employment trends and needs in terms of the knowledge and skills required to adapt becomes even more critical for all stakeholders. These trends vary by industry and geography, and so it is important to understand the industry and country-specific outcomes of the 4IR.

Technology itself offers one path to a solution. In fields from robotics and cybersecurity to supply chain management, many universities, including MIT, are pioneering online programs – such as MicroMasters – that provide top-quality, industry-relevant skills and credentials, in a form recognized by leading employers, and at a fraction of the price of traditional higher education. For people with industry expertise

⁴ Hard skills are technical in nature and related to a specific job or function, with a limited amount of transferability across industries and even across companies within an industry. Given their intransient nature and relation to specific functions, hard skills are more aptly referred to in this paper as technical or job skills. Soft skills, on the other hand, are timeless and durable in career categories across multiple sectors.

who need to become proficient in digital or problem-solving skills, including teachers seeking to prepare their students for the future, an answer could be ‘continuous up-training’: a system that would allow every employee to devote significant time – every week, every month or every year – to acquiring fresh skills. If educational institutions, employers and employees can imagine and refine a solution together, continuous up-training could become a crucial tool to help individuals adapt to relentless change. While technical or transient job skills can often be acquired independently and then assessed for mastery, soft or durable skills require continuous coaching, mentoring, and feedback to understand, apply, and master.

It is believed that complex problem solving, social and systems skills will be far more in demand in the future when compared to physical abilities or content skills. Companies need to adapt to the concept of “talentism”. This is one of the most important, emerging drivers of competitiveness. In a world where talent is the dominant form of strategic advantage, the nature of organizational structures will have to be rethought. Flexible hierarchies, new ways of measuring and rewarding performance, new strategies for attracting and retaining skilled talent will all become key for organizational success.

AI is unleashing a whole new level of productivity and augmenting our lives in many ways. As in past industrial revolutions, it can also be a disruptive force, dislocating people from jobs and surfacing questions about the relationship between humans and machines. It is inevitable that jobs are going to be impacted as AI automates a variety of tasks. However, just as the Internet did 20 years ago, the AI revolution is going to transform many jobs – and spawn new kinds of jobs that drive economic growth. To respond, workers can spend more time on creative, collaborative and complex problem-solving tasks that automation is not well suited to handle. Talent development, lifelong learning, and career reinvention are going to be critical to the future workforce.

While there is no doubt that repetitive tasks will decline, recent reports provide a more positive outlook for the workforce: “The Future of Jobs” report by the World Economic Forum shows that 75 million jobs will disappear and 133 million new jobs will be created by 2022 due to the 4IR, across all geographies, industries and functions. Not only will there be more jobs, but the new jobs will also be more attractive compared to the disappearing jobs, with more diverse and challenging tasks, and a higher emphasis on creativity, problem-solving and interpersonal communications skills.

In manufacturing, while we expect a decline of tasks for assembly and factory workers, material handlers, quality inspectors and maintenance technicians; this decline will be counterbalanced by an increase of roles in the fields of data analytics, AI, software and application development and technologies. The challenge to be overcome, then, is how to re-skill the existing workforce. Efforts to build capabilities are at the forefront for leading organizations. So-called “lighthouse” examples from some of the world’s most advanced 4IR factories are investing significant resources on change management and up-skilling their workforces, with digital academies being deployed to train a large share of their employees. These re-skilling endeavors are supported by the fact that new technologies are becoming easier to implement – for example, employees without IT backgrounds can learn how to develop apps using code-free app development platforms, and collaborative robots can be “trained” without programming.

Expected average re-skilling needs across companies, by share of employees, 2018-2022: No skilling needed = 46%, Re-skilling needs of less than one month = 13%, Re-skilling needs of 1-3 months = 12%, Re-skilling needs of 3-6 months = 10%, Re-skilling needs of 6-12 months = 9%, Re-skilling needs of over 1 year = 10%.

Education and training are at the forefront of how we can flourish within the 4IR. Our traditional education and training have been mono-disciplinary, where we work towards a specific skills set and qualification. But with the 4IR, we need to adapt to an interdisciplinary system, where people can develop their skills set and mindset rather than one field in particular. We will all collectively have to broaden our skills sets,

learn and adopt the new technologies available to us. With these technologies it means we have a library of knowledge which can be easily accessed in order to adapt to the times.

Besides, listing a broad range of skills that graduates should have in 2020, the World Economic Forum defined (based on surveys with chief human resources and strategy officer from leading global employers) the top ten skills in 2020 and how the importance ranking of these skills changed compared to the year 2015 (the information in the bracket is based on the comparison of the skills ranking between 2015 and 2020): (1) Complex problem solving (#1 no change), (2) Critical thinking (#4+), (3) Creativity (#10+), (4) Leadership skills (#3-), (5) Coordinating with others (#2-), (6) Emotional intelligence (new), (7) Judgment and decision making (#8+), (8) Service orientation (#7-), (9) Negotiation (#5-), and (10) Cognitive flexibility (new). (Source: World Economic Forum, 2016).

Creativity is assumed to become one of the top three skills. Future workers have to be more creative in order to develop new products, services, technologies and new ways of working. Complex problem solving is seen as the most important skill enabling future workers to deal with complex issues that future megatrends will bring up. Critical thinking, as well as judgment and decision making are seen to be much more important skills in 2020 than in 2015. Besides, emotional intelligence as well as cognitive flexibility is evaluated to be under the top ten skills in 2020, even though these skills were not seen to be that important in the past (Grey, 2016).

Schaper, in his study on the German educational system, stated that the aim of higher education is to provide students with an “able to act professional education”. All learning processes should be targeted to typical phases of actions like informing, planning, decision making, controlling, evaluating and reflecting. The Bologna-process itself defined four different types of competences that students should gain during their education (Schaper, Niclas et al., 2012):

- **Professional competence:** includes specific skills and abilities that are required to do a certain job (understanding procedures, application of knowledge, analytical skills);
- **Methodological competence:** comprises cognitive and meta-cognitive skills (problem solving, decision making or self-organized learning) that are necessary to solve complex problems;
- **Social competence:** involves knowledge and abilities to realize aims and plans in social interactions, featured by communicative and cooperative behaviors towards other people;
- **Personal and Self-competence:** includes personal disposals like attitude, values and motives that influence the working behavior as well as skills for self-perception (reflection of own skills) and self-organization (time management).

Table- 2.8: Competence portfolios based on the four basic competences

Group of Competences	Competences	Group of Competences	Competences
Professional Competences	<ul style="list-style-type: none"> • Language Skills • ICT Literacy • New technologies (e. g. electronics, IT) • Governance, Risk Management, Compliance • Entrepreneurial skills • Analytical skills (e.g. statistics). 	Methodological Competences	<ul style="list-style-type: none"> • Complex problem solving • Cognitive skills • Savvy in technologies • Creativity • Interdisciplinary skills • Critical thinking • Change management and adaption skills.
Personal and Self-Competences	<ul style="list-style-type: none"> • Time management • Knowledge in psychology and body language 	Social Competences	<ul style="list-style-type: none"> • Interpersonal skills (empathy) • Communication skills • Intercultural skills • Virtual collaboration

Table- 2.8: Competence portfolios based on the four basic competences			
Group of Competences	Competences	Group of Competences	Competences
	<ul style="list-style-type: none"> • Dealing with persistent and pressure • Emotional Intelligence • Judgment and decision making • Intrapreneurial skills (ability to work innovatively and creatively in the workplace) 		<ul style="list-style-type: none"> • Coordinating with others • Open mindset • Negotiation Skills • People management skills • Ethics and social responsibility • Service orientation.

Source: Schaper, N. et al., 2012. Quoted from Eberhard et al. (2017).

In general, training at educational institutions should ensure students acquire these four competences which are valid for every type of study. Consequently, the competence portfolio that is presented in Table-2.8 is based on these competence areas that comprise all the analyzed skills demanded by future labour markets shaped by an increasing digitalization.

Additionally, the World Economic Forum created a broader skills portfolio called “core work-related skills” that is based on the O*NET Content model. In general, the model that was created by the World Economic Forum differentiates between abilities, basic skills and cross-functional skills (WEF, 2016). Based on the skills mentioned in the competence portfolio developed by Sharper and the core-work related skills from the World Economic Forum, one may create a new skills portfolio that comprises the other theoretical findings of required skills and the defined skills from the World Economic Forum. The new skills portfolio is presented in Table-2.9 and focuses on the skills that graduates from each type of study should have in the year 2020 and beyond in order to supply the demands of the labor market in the future.

In Table-2.9, abilities are defined as enduring attributes of the individuals that influence performance. Cognitive skills comprise cognitive flexibility, creativity, logical reasoning, complex problem solving, mathematical reasoning, visualization, and troubleshooting as well as analytical skills like statistics (World Economic Forum, 2016). Personal and mental abilities are a new skills set that was added. A basic knowledge in psychology, the control of body language, resilience and intrapreneurial skills are defined as essential skills that university students should acquire during their education. Cognitive skills, such as originality and active learning, are increasingly becoming more important. The adaptive mindset instilled by soft or durable skills brings an ideology of bend – not break – in adapting to new working environments (Bakhshi et al., 2017).

Besides, basic skills are developed capacities that facilitate learning or the more rapid acquisition of knowledge: content skills like active learning, oral expressions, reading comprehension, written expression as well as ICT literacy. ICT literacy means that students should be trained to use and apply different information and communications technologies. ICT literacy is also a main goal under the EU Horizon 2020 (Eurostat, 2016). Process skills including active listening, critical thinking, self-monitoring, as well as interdisciplinary skills are very important basic skills students have to learn (World Economic Forum, 2016).

Table-2.9: Skills portfolio for training by TVET Institutions			
Abilities	Basic Skills	Cross-functional Skills	
Cognitive skills: Cognitive flexibility Creativity Logical reasoning	Content skills: Active learning Oral expression Reading comprehension	Social-Interpersonal skills: Coordinating with others Emotional Intelligence Negotiation Persuasion	Resource management skills: Management of financial resources

Table-2.9: Skills portfolio for training by TVET Institutions			
Abilities	Basic Skills	Cross-functional Skills	
Complex problem solving Mathematical reasoning Visualization Troubleshooting Analytical Skills (statistics...)	Written expression ICT literacy	Service orientation Training & teaching others Ethics & social responsibility Virtual collaboration Communication skills	Management of material resources People management Time management
Personal/mental abilities*: Knowledge in psychology Body language Resilience Intrapreneurial skills (ability to work innovatively and creatively in the workplace)	Process Skills: Active listening Critical thinking Monitoring self & others Interdisciplinary skills	System skills: Judgment & decision-making System analysis Change management & adaption Governance, risk management Compliance Entrepreneurial skills	Technical skills: Equipment maintenance & repair Equipment operation & control Programming Quality control Technical & user experience design New technologies (ICT, etc.)
Legend: Bold are Added skills *Added skill sets			Intercultural skills*: Language skills Open mind-set

Source: World Economic Forum, 2016.

In Bangladesh, the disparity between the output of the educational system and the skills increasingly being demanded by the advent of the 4IR is of grave concern. TVET students are simply not being prepared to deal with the current rate of change, nor are they equipped with the analytical and technological skills required to adapt, grow and thrive in this environment. For Bangladesh to fully benefit from the opportunities unleashed by the 4IR it is vital that public and private TVET institutions align as a matter of urgency around the real skills demands presented to not only transition of the existing workforce but to equip today and tomorrow’s learners to take their rightful place in the workforce. Lifelong learning along with soft skills will be of paramount importance to sustain the ongoing rapid technological advances which will impact the workforce of the 4IR.

In order to address the monumental changes exacerbated by the 4IR, it is recommended that the TVET institutions adapt their training to integrate all the skills mentioned in the skills portfolio. Furthermore, they should focus their training on the top-ten skills to prepare students with the best education for the job market in the future. In order to accelerate inclusive growth the 8FYP of Bangladesh aims to promote ICT-based entrepreneurship embracing 4IR.

III. Understanding of the Current Course Curricula, Quality of Trainers and Infrastructure of the TVET Institutions

One of the present challenges of TVET in Bangladesh is the limited supply of TVET graduates in terms of market relevance and demand which has jeopardized the sustainability of TVET program in terms of quality and provision of good service. Therefore, the good corporate Governance is a cornerstone and hallmark of any successful entity. The Government has put in place BTEB to ensure positive results. Unprecedented technological shifts unleashed by 4IR and globalization challenges have considerably weakened its role. The policy of the management and lack of suitable curriculum development have attracted debate in the TVET.

BIDS survey finds that weak quality assurance, too few and/or poorly qualified trainers, poor working conditions for trainers, and outdated qualifications, curricula, training materials (including mostly old and obsolete machines and equipment for training) and methods all inhibit the quality of training. Limited labor market information (LMI) and inability to translate such information into improved training undermines relevance of TVET to market demand.

Changes in work technologies, the way work is organized, and the nature, distribution and utilization of occupational skills and knowledge have always had an impact on TVET practice and policy.

III.1 Current Course Curricula

The objective of TVET course curricula is the achievement of the desired learning outcomes (knowledge, skills and competence achieved at the end of the learning process) that fulfills the key stakeholders' expectations: students, employers and community at large. These three domains were identified based on the current application within the context of qualifications frameworks, and are also closely related to the four pillars of learning proposed in the seminal Delors Report (UNESCO, 1996).

According to TVET Institution Census 2015, Bangladesh Technical Education Board (BTEB) – the only statutory body to ensure TVET certification – approves TVET courses in only 42.3 percent of the training institutions, while a larger share of the non-BTEB institutions have either own curricula or Ministry/Department/Agency and other organizations sponsored curricula. BIDS survey finds that only one-third of TVET institutions are registered with the BTEB (Annex-2: Table-1.1). This speaks of the prevalence of a wide variety of course curricula and non-equivalence of level-setting and recognition of learning outcomes followed by TVET institutions. However, BTEB accounts for the larger share (44.2%) of the rural training institutions which account for smaller share of total number of institutions (45.7%) in the country (Table-3.1).

BIDS survey finds that in most cases unqualified and in some cases government officials with little or no exposure to the world of work still tend to prepare and set curricula. Even worse, previously adopted curricula are extended by incorporating new content without scrapping outdated, irrelevant materials. Thus the gap between the TVET training system and employment needs and opportunities keeps widening when the question of “What to train?” is defined by closed-circuit training provider systems. Obviously, uniform quality and standard is not created and embedded into TVET telling heavily upon the effectiveness of TVET.

Course Approval	% of Institutions		
	National	Rural	Urban
Bangladesh Technical Education Board (BTEB)	42.3	44.2	40.6
Own Curriculum	28.3	25.9	30.2

Course Approval	% of Institutions		
	National	Rural	Urban
Ministry/Department/Agency	22.2	21.8	22.6
360 Hours Course not Approved by BTEB	4.1	4.9	3.4
Less than 360 Hours Course not Approved by BTEB	1.8	1.9	1.7
BNFE (Bureau of Non-Formal Education)	0.3	0.3	0.3
NGO Bureau	1.2	1.0	1.3
All Courses	100	45.7	54.3

Source: BBS & NSDC, TVET Institution Census 2015.

Curriculum consists of the knowledge and skills in given subject matter areas – a scope or breadth of content of area and a sequence for learning – that teachers teach and students are supposed to learn. It sets forth the more specific means to be used to achieve the ends of learning goals. In other words, it consists of continuous chain of activities needed to translate educational goals into concrete activities, materials and observable change in behavior (Pellegrino, 2006). A lesson plan, for example, is a curriculum used by the teacher in the classroom.

A study (Mia & Karim, 2015, p.56) reveals that curriculum is not available in about one-third of TVET institutions in Bangladesh. To all intents and purposes, for any TVET institution to achieve its educational and training goals, it needs a curriculum that is functional and relevant to its needs. In times of personal interviews, both BTEB and non-BTEB skills training providers claimed that current course curricula of their institutions provide for updated qualifications of the TVET graduates in terms of market relevance and demand. However, BTEB is fully equipped with qualified curriculum development staff with a full-time Director and an outfit of a number of Curriculum Specialists in all the four TVET streams in order to make the curricula relevant to market demand. But there is no such evidence of adequately qualified curriculum development specialists in the non-BTEB TVET institutions. More importantly, there is an absence of workplace curriculum that is current, accessible and able to be implemented in the workplace. Most of the training curricula lack linkage with industry standards and required work practices.

However, significant progress has been made in relation to the development of skills standards or competency standards that are being used in training. A number of course curricula for the basic and long courses plus the competency standards along with assessment materials have been developed by BTEB. The process being followed to develop competency standards, competency-based assessment materials leading to job-focused skills training is highlighted in Section 5.1.

The family of approaches that can be described as inquiry-based includes problem-based learning, design-based learning, and project-based learning, among others. The success of well-designed and managed problem and project-based curriculum has been documented across many schools and experimental interventions globally. Typically studies find that students exposed to this kind of curriculum do as well as or better than their peers on traditional standardized test measures but significantly better on measures of higher order thinking skills that transfer to new situations, as well as stronger motivation, problem solving ability, and more positive attitudes toward learning (Barron & Darling-Hammond, 2008).

By and large, views and evidence on how policy-makers and TVET institutions in Bangladesh understand track and interact with labor market shifts point to the fact that there exists gaps between the training provided by the TVET institutions and the skills portfolio demanded by the employers. To all intents and purposes, existing curricula are not responsive to prominent labor market shifts, esp. training-to-work transition and work-to-work transition – re-skilling and up-skilling efforts for the current and previous workforce. More importantly, existing curricula are not in sync with “lifelong learning” which is the central message of both the SDGs and the 4IR.

III.2 Quality of Trainers

In relation to education and training services, quality assurance involves planning, implementation, education and training evaluation, reporting, and quality improvement, implemented to ensure that education and training (content of programs, curricula, assessment and validation of learning outcomes, etc.) meet the quality requirements expected by stakeholders (Cedefop, 2011, p. 84-85). Much of this depends upon the quality of trainers.

In what follows we present the qualifications of TVET teachers in Bangladesh. In terms of level of general education, largest proportion of the TVET teachers are masters (34.5%) closely followed by bachelors (33.7%). There exists gender variation among teachers/trainers. However, this variation is not so prominent as in other cases (Table-3.2).

Highest class passed	Total		Male		Female	
	Number	%	Number	%	Number	%
SSC or equivalent	8818	12.3	6569	11.9	2249	13.9
HSC or equivalent	13644	19.1	10235	18.5	3409	21.0
Bachelors	24093	33.7	18984	34.3	5109	31.5
Masters	24697	34.5	19328	34.9	5369	33.1
Ph.D.	259	0.4	187	0.3	72	0.4
Total	71511	100.0	55303	100.0	16208	100.0

Source: BBS & NSDC, TVET Institution Census 2015.

In terms of level of technical education, the scenario is much different. Largest proportion of the TVET teachers (31.8%) have qualification of trade courses followed in order by specialized training in TVET (22.5%) and Diploma in Engineering (21.9%). Across gender, the pattern is more or less the same. These variations, however, are mainly explained by the type and level of TVET stream, trade, duration and number of institutions in each stream (Table-3.3).

Highest class passed	Total		Male		Female	
	Number	%	Number	%	Number	%
Trade Course	23228	31.8	17894	31.9	5334	31.2
Diploma in Engineering	16000	21.9	12493	22.3	3507	20.5
B.Sc. in Engineering	6748	9.2	4934	8.8	1814	10.6
M.Sc. in Engineering	1724	2.4	1119	2.0	605	3.5
MBBS/BDS	3070	4.2	2232	4.0	838	4.9
Specialized Training (in TVET)	16469	22.5	12762	22.8	3707	21.7
Others	5875	8.0	4583	8.2	1292	7.6
Total	73114	100.0	56017	100.0	17097	100.0

Source: BBS & NSDC, TVET Institution Census 2015.

BIDS survey, however, notes that as regards average qualifications of the instructors of the Diploma institutions, Bachelors degree figures most prominently followed by Diploma degree and Masters degree. The case of Ph.D. degree is infrequent. Average years of their experience works out to 10.2 with the highest for the public institution instructors (17.7 years). Average number of courses the instructor takes is the highest in the private institutions (13.9), but average number of hours the instructor has to take per week is the highest in the public institutions (37.7) reflecting much higher teaching intensity and greater

training outcome of the public institutions. Average monthly salary of the instructors is also the highest (Tk. 43500) in the case of public institutions (Annex-2: Table-1.13). In respect of average qualifications of the instructors of the HSC (Vocational)/BM institutions, Bachelors degree figures most prominently followed by Diploma degree and Masters degree. The case of Ph.D. degree is scarce. Average years of their experience works out to 15.1 with the higher for the public institution instructors (17.5 years). Average number of courses the instructor (Annex-2: Table-1.16) takes and average number of hours the instructor has to take per week are much higher in the public institutions reflecting much higher teaching intensity and greater training outcome of the public institutions. Average monthly salary of the instructors is also much higher (Tk. 36624) in the case of public institutions. With respect to average qualifications of the instructors of the SSC/Dakhil (Vocational) institutions, Bachelors degree figures most prominently followed by Masters degree and Diploma degree (Annex-2: Table-1.19). Surprisingly, the case of Ph.D. degree is more frequent in SSC/Dakhil case than in the case of Diploma and HSC (Vocational)/BM institutions. Average years of their experience works out to 15.1 with the highest for the public institution instructors (20.6 years). Average number of courses the instructor takes is the highest in the public institutions (8.7), but average number of hours the instructor has to take per week is the highest in the private institutions (26.2) reflecting much higher teaching intensity and greater training outcome of the private institutions. However, average monthly salary of the instructors is the highest (Tk. 34578) in the case of public institutions as in all the previous cases. As regards average qualifications of the instructors of the NSSB Course institutions, Bachelors degree figures most prominently as in all the three previous cases followed by Masters degree and Ph.D. degree. Strikingly, there is no evidence of instructors with Diploma degree in the lowest echelon of TVET institutions (Annex-2: Table-1.22). Their experience averages to 10.5 years with the highest for the private institution instructors (10.9 years). Average number of courses the instructor takes is slightly higher and average number of hours the instructor has to take per week is greatly higher in the private institutions (28.4) reflecting much higher teaching intensity and greater training outcome of the private institutions. However, average monthly salary of the instructors is the highest (Tk. 22385) in the case of NGO institutions in stark contrast to all the previous cases.

According to BANBEIS, as in 2018 there are only two public technical teachers training institutes in the country – Technical Teacher Training College (TTTC) with 26 teachers and 87 enrollment and Vocational Teacher Training Institute (VTTI) with 11 teachers and 52 enrollment. This speaks of limited supply of technical teachers in the face of huge demand for them in the country.

Besides, the professional qualifications of the teachers noted in Tables-3.2 and 3.3 are inadequate in explaining whether the existing TVET teachers are capable of delivering what are expected of them in order to meet the varied needs of the students. According to Bangladesh Skills Snapshot 2012 (TRP, 2012), TVET institutions under the DTE are in crisis of teachers in terms of not only number but also their competence in delivering skills. It remains to be seen whether the TVET teachers are trained in teaching methodology, and have practical skills and industrial experience.

A recent study (Khan, 2019) finds that the quality and effectiveness of TVET training is hampered by: (i) lack of trained teachers due to low output by TVET teachers training institutions; (ii) lack of in-service training opportunities, and poor incentives; (iii) absence of quality of teaching and learning outcomes resulting from inadequate provision of modern learning facilities; (iv) high (about 50%) vacancy rate for teaching positions in public training institutions; (v) curriculum updating not adequately adaptive due to the centralized control; overreliance on written examination; (vi) overemphasis on theory in teaching and testing rather than on practical instructions; (vii) inadequate financing to maintain facilities, use of old-fashioned equipment, and consumables and training materials for training; (viii) poor labor market research and weak linkage with the industries leading to TVET courses with missing links to emerging industry demand, green jobs, technological changes due to 4IR; and (ix) absence of government systems to delegate powers, particularly to public training institutions, to generate earnings, hire trainers and

resource persons with industry experience, offer market responsive flexible courses, and enter into partnerships with employers to make relevant training and place graduates in jobs.

According to BIDS survey, assessment of the proficiency of teachers in teaching by the Principal or head of the TVET institutions is revealing. The proportion of teachers who received training in TVET pedagogy is most highly rated followed in order by that generally the syllabuses are fully covered, the syllabus is explained at the beginning of the course and the teachers explain the material clearly and in ways that are easy to understand, offer alternative explanations or additional examples, and clear up confusion. The indicators which are moderately rated are the following: (a) the teachers understand the difference in pedagogy between general education and technical & vocational education; (b) the teachers are well versed in theoretical aspects of the subjects taught; (c) the teachers are well versed in practical aspects of the subjects taught; (d) the teachers are organized and prepared for every class; (e) the teachers use a variety of activities (discussion, group work, lecture, labs, technology, etc.) during class time; (f) the teachers encourage creativity in the class works and assignments; (g) the teachers have adequate educational background; and (h) the performance of the teachers in the national exams (SSC or HSC) is good (Annex-2: Table-1.25).

Student evaluations of teaching are one of the main tools to evaluate teaching effectiveness. BIDS field survey finds that TVET students highly rated their teachers. Among the several measures the most important is that generally the syllabuses are fully covered followed in order by that the teachers are punctual and utilize the class-time properly, that the teachers explain the material clearly and in ways that are easy to understand, offer alternative explanations or additional examples, and clear up confusion, and that the teachers are well versed about theoretical and practical aspects of the subjects taught. Among other measures mention can be made of that the teachers are academically and professionally qualified to teach, the teachers are organized and prepared for every class, the teachers are apt at taking practical classes and good at demonstrating the usage of various lab equipment, and the teachers encourage creativity in the class works and assignments (Annex-2: Table-3.15).

Effective educators/trainers are important in their own right. High quality teachers are the hallmark of any education system. However, the power of a great teacher cannot be overstated. BIDS field survey finds that TVET graduates highly rated their teachers. Among other measures mention can be made of that the teachers were well versed about practical aspects of the subjects taught, teachers were academically and professionally qualified to teach, the teachers were organized and prepared for every class, the teachers were apt at taking practical classes and good at demonstrating the usage of various lab equipment, teachers were punctual and utilized the class-time properly, and the teachers encouraged creativity in the class works and assignments (Annex-2: Table-2.12).

III.3 Infrastructure

According to TVET Institution Census 2015, about three-fourths of the TVET institution (74.5 %) do not receive any kind of financial and technical assistance from the government or development partners/NGOs and only 25.5 percent of them receive such assistance (26% urban and 24.8% rural). On average only 8.9 percent of the institutions provide residential/hostel facilities to the students and the rest 91.1 percent of them do not have any hostel facilities. More disappointingly, institutions under MPO and individual ownership have much below average residential/hostel facilities. A total of 84.4 thousand seat capacity is recorded; of them government/semi-government/autonomous institutes account for 50 percent followed by those under individual ownership 16.7 percent and Non-MPO 14.7 percent (Table-3.4).

Type of TVET Institutions	Hostel Facilities Available (%)
Corporate/Trustee Board	29.8
Govt/Semi-Govt/Autonomous	19.2
Partnership	17.7
Foreign/Joint Venture	16.8
Non-MPO	16.0
MPO (Monthly Pay Order)	6.0
Individual Ownership	3.7
Average	8.9

Source: BBS & NSDC, TVET Institution Census 2015.

According to BIDS survey, vast majority (95.2%) of the TVET institutions are either fully/partly donor financed or partly government financed. Only one out of 145 institutions is fully privately-financed. The rest remains unclassified (Annex-2: Tables-1.1-3). On average majority of the TVET institutions have ownership of the place of institution with the highest for public institutions (88%), but no residence facility for the students with the highest for private institutions (83.5%). However, most of them have online teaching capacity with the highest for public institutions (96%).

Of the available residential seat capacity, much larger proportion is occupied by the male students. This is much more so in the rural areas (Table-3.5).

Locality	Sex (%)	
	Male	Female
Rural	75.4	24.6
Urban	53.6	46.4

Source: BBS & NSDC, TVET Institution Census 2015.

According to BIDS survey, average amount of land available for the institution is the highest for the public institutions (5.26 acre), while it is much below average for the NGO and private institutions. Public institutions also have the highest number of building/structure (6.3) compared to below average for the private institutions. In the same vein, 88 % of the public institutions have ready land for developing new buildings in the existing campus compared to 88.9 percent for the NGO and 67.8 percent for the private institutions (Annex-2: Table-1.2).

Classrooms and Facilities: As expected, class rooms' account for the largest share (56.4%) followed by other rooms (30.1%) and labs (10.2%). Average size of the room looks proportionate to the purpose they are used (Table-3.6).

Type of Rooms	Number of Rooms	Percent of Rooms	Total Space (In sq. ft.)	Average Space (In sq. ft.)
Classroom	57702	56.4	19178790	332
Lab	10482	10.2	5047755	482
Workshop	3257	3.2	2251314	691
Other Rooms	30829	30.1	10830273	351
Total	102270	100.0	37308132	365

Source: BBS & NSDC, TVET Institution Census 2015.

As regards the average number of rooms, BIDS field survey finds that NGO institutions figure most prominently (72.6) followed by public institutions. Private institutions show much below average number of rooms. Across different uses, however, the distribution of rooms among the institutions shows an erratic pattern. For the largest proportion of the NGO institutions the condition of both class rooms and lab rooms is good (88.9 & 77.8 % respectively). For a sizable proportion of both public and private institutions class rooms and lab rooms are workable but repair is needed.

In terms of category of ownership, average room space is higher in public TVET institutions in all cases except in the case of other rooms where it is slightly lower in public institutions than in foreign/joint venture institutions. In the case of labs and workshops the average room space in public TVET institutions is much higher than in any other category of TVET institutions. By and large, public sector TVET institutions provide much better education and training facilities in terms of room, and hence academic space (Table-3.7).

Type of ownership	Total		Classroom		Lab		Workshop		Other Rooms	
	No. of room	Average space	No. of room	Average space	No. of room	Average space	No. of room	Average space	No. of room	Average space
Public	14604	585	5699	582	1843	749	1113	1046	5949	451
MPO	36867	296	24291	261	2397	446	836	473	9343	330
Non-MPO	19378	365	11190	342	2707	426	524	527	4957	369
Individual	23324	309	12994	308	2344	368	423	472	7563	285
Partnership	5470	423	2306	467	816	459	218	573	2130	347
Corporate	1637	458	708	510	294	542	77	541	558	338
Foreign/Joint v	990	511	514	492	81	613	66	738	329	469
Total	102270	365	57702	332	10482	482	3257	691	30829	351

In general, average room space is slightly higher in urban than in rural areas. By category of rooms, average room space is higher in urban areas in all cases except in the case of other rooms where it is slightly higher in rural areas (Table-3.8).

Type of Rooms	Rural		Urban		Total	
	Total Rooms	Average Floor Space	Total Rooms	Average Floor Space	Total Rooms	Average Floor Space
Class room	25896	305	31806	355	57702	332
Lab	3305	475	7177	485	10482	482
Workshop	982	681	2275	696	3257	691
Other Rooms	11233	372	19596	340	30829	351
Total	41416	345	60854	378	102270	365

Source: BBS & NSDC, TVET Institution Census 2015.

From TVET Institution Census 2015 it is, however, not known whether these infrastructural facilities in the TVET institutions are adequate for training purposes. A survey by Mia & Karim (2015), however, reports that equipment necessary for skills training specific to given jobs in the existing training curriculum are not available at about one-third of the institutions. On top of that five percent of institutions do not make use of the available equipment. The reasons reported for non-utilization of equipment are: 'instructors not available', 'instruments out of order', 'operation expensive' and 'management careless', etc. Besides, anecdotal evidence (experiences of Skills Development Project of ADB) reveals that TVET institutions have poor infrastructure, such as inadequate classrooms, workshop rooms, training equipment, and teaching and learning materials.

According to BIDS field survey, however, a vast majority of the NGO institutions (88.9%) report that the number of equipment in the lab rooms is adequate, while for majority of the public (56%) and private (59.5%) institutions inadequacy of equipment in the lab rooms prevails (Annex-2: Table-1.6). For 64 percent of public institutions the number of first set of major equipment in the lab rooms is inadequate compared to 63.6 percent for private and only 22.2 percent for NGO institutions. Thus for overwhelming majority of the NGO institutions (77.8%) the number of first set of major equipment in the lab rooms is adequate. Similarly, 68 percent of public, 77.8 percent of NGO and 48.8 percent of private institutions report that first set of major equipment in the lab rooms are neither modern nor old. The use of first set of modern major machines and equipment is very few and far between across the board (Annex-2: Table-1.7a). For 64 percent of public institutions the number of second set of major equipment in the lab rooms is inadequate compared to 60.5 percent for private and only 22.2 percent for NGO institutions. Thus for overwhelming majority of the NGO institutions (77.8%) the number of second set of major equipment in the lab rooms is adequate. In a similar vein, 56 percent of public, 44.4 percent of NGO and 49.6 percent of private institutions report that second set of major equipment in the lab rooms are neither modern nor old. However, the use of second set of modern major machines and equipment is much higher (44.4%) in the NGO institutions than in the public (12%) and private institutions (24.4%) (Annex-2: Table-1.7b). For 72.7 percent of public institutions the number of third set of major equipment in the lab rooms is inadequate compared to 58.7 percent for private and only 22.2 percent for NGO institutions. Thus for overwhelming majority of the NGO institutions (77.8%) the number of third set of major equipment in the lab rooms is adequate. In a similar vein, 54.5 percent of public, 66.7 percent of NGO and 44.9 percent of private institutions report that third set of major equipment in the lab rooms are neither modern nor old. However, the use of third set of modern major machines and equipment is much higher (25.7%) in the private institutions than in the NGO institutions (11.1%) and none in the case of public institutions (Annex-2: Table-1.7c). For 66.7 percent of public institutions the number of fourth set of major equipment in the lab rooms is inadequate compared to 56.8 percent for private and none for NGO institutions. Thus for all the NGO institutions (100%) the number of fourth set of major equipment in the lab rooms is adequate (Annex-2: Table-1.7d). In a similar vein, 60 percent of NGO institutions report that fourth set of major equipment in the lab rooms are neither modern nor old. However, the use of fourth set of modern major machinery and equipment is much higher (26.4%) in the private institutions than in the public institutions (14.3%) and none in the NGO institutions. However, majority of the public institutions (52.4%) report that fourth set of modern major machines and equipment are old. By and large, across the board there exists scary variation in the adequacy and lifetime of the major machinery and equipment in use in the TVET institutions. However, post-2015 scenario looks encouraging due to SEIP contribution in their capacity building.

Future Needs of the TVET Institutions

BIDS field survey finds that the needs of the TVET institutions within the next 5 years and within the next 10 years manifest in (i) the needs for teachers, (ii) the needs for teachers training, and (iii) the needs for training equipment. As regards needs for teachers, the TVET institutions indicate the following in order of importance: (a) trade based skills training, (b) increased salary & other allowances, (c) ensuring health & accommodation facility, (d) need for foreign training, and (e) regular promotion. Among minor needs for teachers mention can be made of industrial linkage of the teachers, official recognition of teachers job, and separate room for teachers. With regard to needs for teachers training, trade-based necessary training materials (e.g. router, electrical training table etc) figures most prominently followed by laptop/computer, cost-free training, expert trainers, master trainers, modern training equipment including lab, and separate hall room. In respect of the needs for training equipment, router comes out most prominently followed by modern equipment, PLC, CNC lathe machine, digital white board and laptop (Annex-2: Table-1.9).

Industrial Attachment

Industrial attachment of the TVET students is considered as one of the most important aspects of TVET education and it is intended to familiarize students with all machinery, tools and accessories used in industries and equip them with hands-on learning/experience in the production/work process. It creates the environment where the TVET students can relate theory to practice through simulated work environment in institutions and workplaces. Apprenticeships, traineeships and cadetships are at the core of industrial attachment within TVET. Within these schemes there are international variances in paid, unpaid, full-time and part-time arrangements. These types of attachments were traditionally designed for young learners aspiring to become employable in their chosen fields.

TVET Institution Census 2015 reports that only 24.4 percent of TVET institutions have industrial attachment facilities. Among those who have these facilities non-MPO institutions figures most prominently (55.3%) followed by MPO, foreign/joint venture and corporate/trustee institutions. TVET institutions under individual ownership which account for the largest share (48%) of total institutions have the least proportion (5.7%) of industrial attachments facilities. In this regard, public sector institutions fare worse than all other types of institutions except those individually owned (Table-3.9).

Ownership Type	Total		Yes		No	
	Number	Col. %	Number	%	Number	%
Government/Semi-Government/Autonomous	1731	13.2	479	27.7	1252	72.3
MPO (Monthly Payment Order)	2517	19.1	1181	46.9	1336	53.1
Non-MPO	1623	12.3	897	55.3	726	44.7
Individual Ownership	6313	48.0	360	5.7	5953	94.3
Partnership	717	5.4	179	25.0	538	75.0
Corporate/Trustee	161	1.2	73	45.3	88	54.7
Foreign/Joint Venture	101	0.8	47	46.5	54	53.5
Total	13163	100.0	3216	24.4	9947	75.6

Source: BBS & NSDC, TVET Institution Census 2015.

According to BIDS field survey, however, a clear majority (54.2%) of the TVET institutions have linkage/attachment with the industries with the best performance of the NGO institutions. Average duration of this attachment/linkage is more than 113 months. Larger proportion (53.4%) of the TVET institutions also offer apprenticeship. About one-third of this apprenticeship is salaried. As high as 63.64 percent of students who passed in 2018 and 64.4 percent of students who passed in 2019 got an apprenticeship. However, all the TVET institutions point to the pressing need to maintain close links between industry and schools (Annex-2: Table-1.24).

Table-3.10 shows that the largest proportion of the TVET institutions (55.9%) practicing hands-on training of their students in the industries have a duration of 1–3 months followed by less than one month (19.4%) and 3–6 months (16.3%) reflecting inadequate school-industry linkage in terms of duration.

Duration of Industrial Attachments	TVET institutions (Multiple answers possible)	
	Number	%
< 1 month	681	19.4
1-3 months	1963	55.9
3-6 months	573	16.3
6-12 months	240	6.8

Others	57	1.6
All Cases	3514	100.0
Source: BBS & NSDC, TVET Institution Census 2015.		

In this context, the experiences of Germany – a showcase global example of TVET success story – are illuminating. In Germany there is a special way of learning a trade: the dual vocational training system – attending classes at a vocational school and receiving on-the-job training at a company. Such programs offer plenty of opportunity for on-the-job training and work experience. Programs usually last between two and three-and-a-half years and comprise theoretical as well as practical elements – spending one or two days a week, or several weeks at once, at a vocational school and acquiring the theoretical knowledge needed in the future occupation, the rest of the time spending at a company to apply newly acquired knowledge in practice, for example by learning to operate machinery, knowing what the company does, learning how it operates and finding out if one can see oneself working there after completing one’s training. This cooperation is regulated by law. This combination of theory and practice gives a real head start into the job. There are around 350 officially recognized training programs in Germany (www.make-it-in-germany.com). There are currently around 330 occupations requiring formal training in Germany. Employers organizations and trade unions are the drivers when it comes to updating and creating new training regulations and occupational profiles or modernizing further training regulations. As a result, training, testing and certificates are standardized in all industries throughout the country. This ensures that all apprentices receive the same training regardless of region and company. Moreover, employers have trust in these certificates as they provide evidence of what an individual knows and is able to do (<https://www.bmbf.de/en/the-german-vocational-training-system-2129.html>, quoted in Khan, 2019).

Industrial attachment is not only critical for trainees, it is equally important for teachers, trainers and instructors (referred to as TVET practitioners). TVET practitioners are involved in a range of ‘direct’ activities, such as delivery, development, and review and assessment of courses or modules. DTE (2019) reports that up to June 2019 there are 260 institute-industry linkages and 119 industry-based trained teachers in the BTEB approved institutions.

In many instances, training and skilling for employment is conducted solely within educational institutions. This approach is described as the ‘front-end’ model. The failures and limitations of the front-end model generated debates and triggered an increase in the integration of on-the-job and off-the-job learning. The workplace provides the most authentic learning environment and a context for learners to transform and construct vocationally and socially meaningful knowledge and skills. Industrial attachment is seen as an effective professional development activity for TVET practitioners to maintain the currency of their vocational knowledge and expertise including their knowledge of technologies and practices commonly used in contemporary workplaces. This ongoing development is necessary because the role of TVET practitioners is constantly changing (Choy & Haukka, 2009).

TVET in most regions of the world is founded on partnerships between the government, industry and TVET providers. There is much evidence of successful and supportive partnerships for the delivery of TVET for aspiring workers. By dint of the active role of SEIP industries in Bangladesh are now more active in the development of the workforce and enhancing the social and economic capital through employers. They contribute to the establishment of standards and industry competencies and provide situated learning and training opportunities for trainees.

Job Placement

Work or job placements give students the opportunity to gain skills specific to their subject or industry of choice as well as the employability skills required for real-life work. It also increases their knowledge of

an industry or sector, allowing them to make better informed decisions about future career choices. It provides all benefits of work experience. According to TVET Institution Census 2015, nationally only 8.4 percent of TVET institutions provide job placement facility. However, job placement facility is much higher in the urban than in the rural areas (Table-3.11) obviously because of greater job openings in the urban areas.

Type of Facilities Provided (Multiple Answers Applicable)	National		Rural		Urban	
	Number	%	Number	%	Number	%
Scholarship for poor & meritorious students	4890	28.9	2129	28.4	2761	29.3
Free tuition	6622	39.1	3377	45.1	3245	34.4
Job placement	1424	8.4	362	4.8	1062	11.3
No facilities provided	2555	15.1	1058	14.1	1497	15.9
Others	1426	8.4	561	7.5	865	9.2
Total	16917	100.0	7487	100.0	9430	100.0

Source: BBS & NSDC, TVET Institution Census 2015.

Post-2015 developments in job placement of the TVET graduates is, however, remarkable due to SEIP contribution (see Table-2.4).

IV. Understanding of Mismatch between the Market Demand and the Supply of Skills by TVET

Skills obtained through training and those required by the job often do not match, resulting in skills shortages in some areas and, simultaneously, a surplus of workers with skills that are not in demand, contributing to unemployment. According to an earlier ADB-sponsored study (Mondal & Chowdhury, 2015), across all TVET streams under study skills mismatch⁵ is rather enormous on average (23.55%) ranging from 10.89 percent in the case of SSC graduates to 50 percent in the case of HSC graduates. These findings indicate that BMET graduates, being more often directly oriented to the requirements of skilled manual jobs, is associated with a lower likelihood of qualification mismatch. This effect is present both in the short term (first job) and in the longer term (current job), indicating that the effects of TVET on the probability of being mismatched are persistent. The effect of TVET on qualification mismatch appears to be driven mainly by a lower probability of under-qualification for BMET graduates, yet among these graduates a technically-oriented program is more likely to result in over-qualification. Diploma graduates are more likely to use formal job finding methods and BMET graduates enjoy job search assistance through a consortium of SDP, BGMEA and BMET; while other TVET streams graduates tend to compensate for lack of a direct link between their education and the labor market with informal job finding methods. BIDS field survey finds that job search by the labor force is much more informal than formal. Friends and relatives accounts for the largest share (45.6%) followed by TVET institutions (37.3%). The respective share of newspaper, internet posting and others is negligible (Annex-2: Table-2.18). All this speaks of very weak competitive edge of the TVET graduates in the formal labor market. Literature emphasizes that, although informal methods accelerate the job finding process, the resulting quality of the match can be suboptimal. Jobs found through personal contacts tend to be associated with lower wages and higher quit rates than jobs found through formal channels.

According to a recent study (Mondal, 2018b), labor force participation rates of the TVET graduates and their high unemployment rates reflect serious skills mismatches pointing to the need for further training. These mismatches are attributable to: (i) poor quality of skills that they acquire, and (ii) ineffective job matching mechanism. This calls for effectuating job-matching skills. This finding is corroborated by the most recent BIDS field survey which comes up with the finding that largest proportion of the TVET graduates are studying full-time and not working (45.7%) followed by those who are wage employed (35.2%) and self-employed (8.3%). This outcome has taken place primarily due to the preponderance of SSC/Dakhil (Voc) graduates who are studying full-time and not working (78.6%). Besides, the share of the graduates who are studying full-time and working part-time is also the highest in the case of SSC/Dakhil (Voc) graduates. The proportion of the graduates in wage employment is the highest in all the three remaining streams – Diploma (75%), HSC (Voc) (75%) and NSS Basic (44.5%), while the share of wage employment and self-employment is equal in the case of SSC/Dakhil (Voc) graduates reflecting competitive disadvantage of these graduates in the labor market. There is no evidence of unemployment in the case of HSC (Voc.) and SSC/Dakhil (Voc.) graduates. All the HSC (Voc) graduates are employed. Only NSSB graduates show three cases of NEET (neither in employment nor in education and training). Across the board, 51.5 percent of the graduates are not entering the labor market. This is much more so in the case of SSC/Dakhil (Voc) graduates (83.3%) who go for higher studies (Annex-2: Table-2.13). Across the board, unemployment rate of the TVET graduates works out to 9.55 percent which is much

⁵ Mismatch refers to situations where a person does not meet the job requirements and where there is a shortage or surplus of persons with a specific skill. It includes different types of skill gaps and imbalances such as over-education, under-education, over-qualification, under-qualification, over-skilling, skills shortages and surpluses, skills obsolescence and so forth. Skills mismatch can be identified at the individual, employer, sector or economy level (ETF, Cedefop & ILO, 2016. p.215).

higher than the national average of 4.2 percent in 2016-17 (latest year for which the information is available). This is much more so in the case of NSSB graduates (13.2%).

According to Mondal & Chowdhury (2015), skills mismatch varies widely among employed diploma graduates across trades. Among the diploma trades, skills mismatch figures most prominently in electro-medical and mining & mine survey (42.9% each) followed by environmental (30.4%) and civil and civil wood (26%). Among the employed HSC graduates, skills mismatch is most critical in the case of fish culture & breeding (100%) followed by computer operation and maintenance (81.8%), agro machinery (75%), refrigeration & air-conditioning (57.1%) and welding & fabrication (55%). Among the employed SSC graduates, skills mismatch is most critical in the case of agro-machinery, electronics control & communication, and refrigeration & air-conditioning (100% each) followed by fish culture & breeding, and welding & fabrication (66.7% each) and clothing & garments finishing (60%). Among the employed MRTC (market responsive trade course – short course) graduates, most prominent skills mismatches are found in plumbing & pipe fitting (54.5%) and welding & fabrication (53.4%). Among the employed DYD (Department of Youth Development) graduates, most noticeable skills mismatches are shown by poultry (48.5%) distantly followed by livestock (28.9%). Encouragingly, there is no incidence of skills mismatch in the case of horticulture & gardening, veterinary, integrated farms, nursery, dairy farm, cow fattening and DYD agriculture. Among the other short course graduates, skills mismatch is predominant in carpentry cum wood work machine operation. There is no incidence of skills mismatch in the case of CNC machine operation and web designing.

The study further finds that many employers find it hard to recruit people with right skills. This is particularly true in manufacturing, where skills shortages affect as many as two in ten vacancies (20%). Agriculture and business services are not far behind – 18% of vacancies are affected by skills shortages – followed by transport & communications (16%), community, social & personal services (14%), electricity, gas & water (13%) and construction (12%). Sub-sectors of the industry also face enormous growth in the demand for skilled labor. By and large, the number of TVET graduates far outweighs the number of vacancies on offer in various sectors. Addressing skills mismatch thus requires: (i) a careful consideration of both the demand and supply sides of the labor market, so as to understand better the variety of factors which may have a negative impact on the effectiveness of skills formation and development, skills maintenance, and also skills use; and (ii) government investment in overcoming skills mismatches in the targeted sectors and trades.

Skills mismatch has several causes including business cycle effects, heterogeneity among TVET graduates and jobs, information asymmetry between employers and TVET graduates, labor market frictions, the responsiveness of TVET system, rapid technological change, or skills obsolescence. Skills mismatch can explain the coexistence of high unemployment and underemployment rates and many vacancies for several occupations. The hiring methods reflect the possibility that the vacancies posted by firms may not or may be inappropriately filled by job seekers because they do not have the necessary skills, resulting in skills shortages or skills gaps. Thus in the slack labor market of Bangladesh, the phenomenon of TVET graduates accepting jobs that require lower qualifications than their own (i.e. over-qualification) also ensues. The incidence of such skills mismatch can be reduced through better management and more transparent information.

Most interestingly, however, post-2015 scenario of the incidence of skills mismatch in Bangladesh looks much different. BIDS field survey (2021) finds very limited or no evidence of skills mismatch among the employed TVET graduates. There are two cases of day labor in welding & fabrication and two cases of office assistants in database programming and computer programming out of 79 employed in NSSB stream. This could be largely explained by the exemplary contribution of the ADB's SEIP. Similarly, there are three cases of office assistants – two in computer & information technology and one in general electrical works out of 20 employed in SSC/Dakhil (Voc) stream. There is a single case of office assistant

in automobile out of 8 employed in HSC (Voc)/BM stream. Finally, there are three cases of office assistants in civil, garments design & pattern making, and pharmacy out of 34 employed in Diploma stream. For all practical purposes, the job of day labor and office assistants could be the first job and/or related to the respective trades of training of the employed graduates (Annex-2, Table-2.13A).

IV.1 Market Relevance and Effectiveness of TVET

Mondal & Chowdhury (2015) study finds that according to most of the TVET graduates TVET is suitable in obtaining job. In other words, existing TVET program is viewed by most of the graduates as very much relevant to market demand. Most of them agree that their training adequately prepared them for work, their employers are satisfied with their level of knowledge and skills, it was easy for them to get a job, they can easily be trained to improve their level of skills, they find themselves very effective in their current job, and they can easily change employers within their respective area of specialization. Employed TVET graduates have different ratings of change for improvement of TVET training components to prepare graduates for the job market. Largest proportion of them favor no change and second largest proportion of them are in favor of partial change of the training components.

The study further finds that in terms of employment TVET graduates are in great demand in the labor market. Overall, they account for 53.9 percent of the total number of technical staff and workers employed by the employers in different sectors. Largest proportion of them are employed in the manufacturing of construction products (92.8%) followed in order by education (teaching) (81.7%), solar power (76.5%), trading of agricultural products (71.4%), manufacture of electrical products (65.4%) and electrical products services (61.8%). The least users of TVET graduates are the employers in manufacturing of medical equipment (2.7%) followed in order by garments (5%) and agro processing (9.8%) particularly because existing TVET system is peripheral in the trades catering to the mainstream needs of these sectors. Demand for the TVET graduates in other sectors lies in between.

However, across type of technical staff employed there exists wide variation in the demand for TVET graduates. All the diploma engineers (100%) employed in education, solar power, services other than medical and electrical, and trading of agricultural products, are TVET graduates. Besides, overwhelming majority of the TVET diploma graduates are employed in IT (97.8%), garments (97.4%), real estate/construction (97.2%), manufacturing of electrical products (96.6%), agro processing (93.8%), electrical products service (83.6%) and medical service (71.4%). TVET technicians are in great demand only in education (70.5%) and solar power (66.7%). Demand for TVET technicians is non-existent in the manufacture of medical equipment, medical services and agro processing, and in other sectors its share varies between 2.2 percent in garments to 41 percent in the trading of agricultural products. As for the workers, largest share of the TVET graduates is found in the manufacture of electrical products (89.5%) followed by education (88%) and electrical products service (68.8%).

Almost all of the employers (95.1%) across the board are satisfied on the performance of the TVET graduates. While all the employers in the manufacturing of electrical products, construction products and medical equipment, medical and other services, architecture firms, education and production of solar power are satisfied, only a few in real estate and other sectors are not satisfied. It means that TVET graduates are faring well across the board. In the same vein, almost all of the employers (94.5%) across the board have full confidence in the competence of the TVET graduates who are both trainable and adaptable. There is no divided opinion among the employers in the manufacturing of electrical products and medical equipment, architecture firms, trading of agricultural products and production of solar power. Majority of the employers (56.8%) are not willing at all to send their recruited TVET graduates for overseas training implying that existing competence of the TVET graduates is adequate to serve their

purpose. However, a sizable proportion of the employers (36.4%) favor overseas training of the TVET graduates sometimes in order to improve their competence.

IV.2 Improving TVET Quality for Matching Skills Demand and Supply

The very idea of an optimal and perfect match between the supply of skills from the education and training sector and the demand for skills from the labor market (skills match/mismatch) that was advocated by manpower forecasting and human capital approaches has been largely questioned from several theoretical (i.e. new political economy of skills) and political stands. There is ample evidence of the persistence of low skills equilibrium⁶ or a “low-skill path” or “trajectory” in many countries, where the competitiveness of companies is basically based on a low-price product strategy and the low wages of workers. In low-skills equilibrium, people are matched with their jobs but at a very low level of skills. Low-skills equilibrium can adversely affect the economic development of a local economy, region or sector, or indeed an entire country (Figure 4.1). These price-based strategies leave the local workforce vulnerable to displacement because of innovation and competition in global markets and workers have few incentives to remain in education because local employers are neither seeking, nor are they willing to reward, high levels of skills. For their part, employers have little incentive to upgrade production processes or workers' skills since this can undermine their price-based competition strategy (Wilson and Hogarth, 2003). These examples demonstrate that a perfect match between available skills and job tasks is not always a positive indicator.

Low employer demand high for higher level skills	SKILLS SHORTAGE IMBALANCE – mismatch caused by companies demanding higher qualifications than are available in the local workforce	HIGH SKILL EQUILIBRIUM – economy with a strong demand for high level skills, which has a positive effect throughout the supply chain on enhancing the aspirations and actions of individuals with respect to participation in education and training
	LOW SKILL EQUILIBRIUM – employers face few skill shortages in a predominantly low skilled workforce, where there is little incentive to participate in education and training and raise qualification levels and aspirations	SKILLS SURPLUS IMBALANCE – mismatch caused by a workforce which cannot find local employment to match their skills and aspirations
	low high	skills surplus

Figure 4.1: Low Skill Equilibrium and Alternative Scenarios
 Source: Adapted by Wilson and Hogarth, 2003, from Green et al. (2003).

Figure 4.1 presents a brief summary of what constitutes a low skill equilibrium (LSEq) and various alternative scenarios. This places a strong emphasis on the balance of demand and supply for skills. A

⁶ The phrase “low skill equilibrium” was first coined by Finegold and Soskice (1988). They argued that Britain as a whole was trapped in a low skill equilibrium: “...in which the majority of enterprises staffed by poorly trained managers and workers produce low quality goods and services” (op cit p.22).

common misinterpretation is that an economy is in an LSEq if average wages are low while employment levels are high. However, to characterize every situation of low wages and high employment as a LSEq begs a number of questions. Such a situation can arise for a number of different reasons, not all of which are readily distinguished. The LSEq term has tended to be used to describe a macroeconomic situation across the whole economy.

An LSEq is more than a simple “market failure”. It is a fundamental and broadly based “systems” failure. Taking action to change any one element of the system may, at best, only lead to marginal improvements. Given the economic “theory of the second best”, there is also a real concern that, if there is a general systems failure, it might be a mistake to try to do anything (since intervention though well intended might make things worse). While most would probably agree that this was a risk, it is also a counsel of despair and overly pessimistic. A more positive conclusion is that there is no simple solution, but a need for wide ranging policy initiatives that involve more than just the labor market (Wilson and Hogarth, 2003).

It is important to understand that lifelong learning policies cannot aspire to provide better welfare opportunities if they operate in a context of high unemployment rates and low-paid jobs. Lifelong learning policies should be an integral part of national and local skills strategies to upgrade the demand for skills and a better skills utilization in the economy (Warhurst and Findlay, 2012), avoiding this way low skills equilibria that only generate poor working conditions and large social inequalities. These national and local skills strategies require a high degree of coordination between actors and governance activities across different areas and scales of government, and beyond government, in the formulation and implementation of skills policies for young people.

For understanding the relationship between skills supply and demand in different settings, often referred to as skills ecologies, Froy (2009) adapted a typology splitting the skills ecologies into four broad categories as illustrated in Figure 4.2. According to this typology, countries can broadly fall into four different categories: countries experiencing low-skill equilibrium, countries experiencing skills gaps and shortages, countries experiencing a skills surplus, and lastly countries experiencing a high-skills equilibrium.

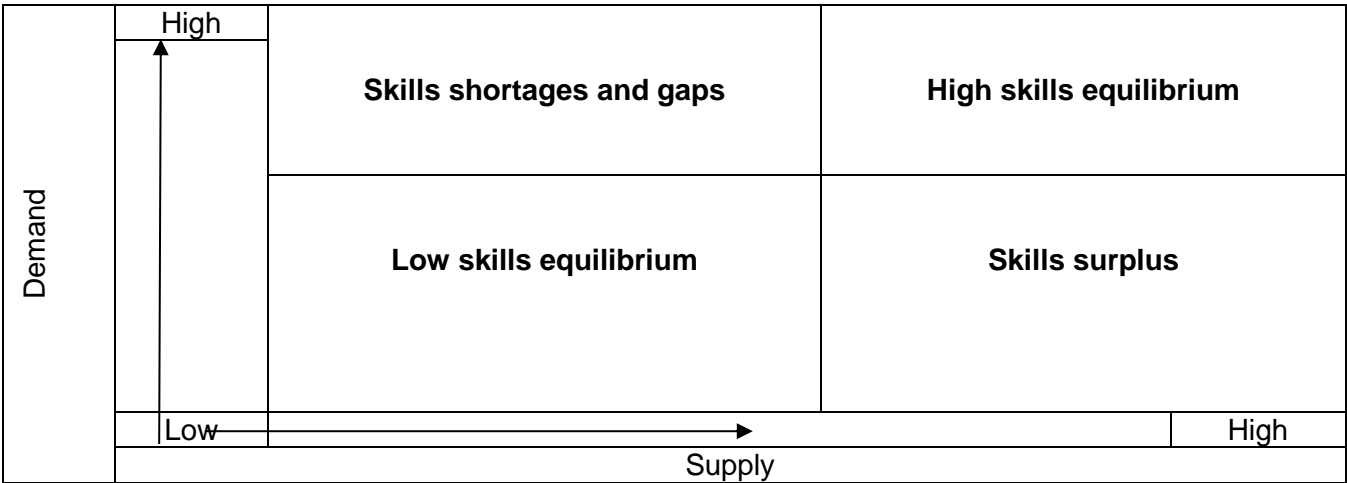


Figure 4.2: Skills typology
 Source: Adapted by Froy (2009) from Green et al. 2003.

These categories are used to explore the varying challenges of different labor markets, and the efficacy of some of the solutions developed by policymakers and businesses. To illustrate a little further on the categories shown above, it is best to start at the top with the high skills equilibrium, the often desired long-term goal for policymakers. This is, however, a very difficult balancing act, requiring: (a) favorable

conditions for businesses; (b) high quality, responsive and socially inclusive education and skills services; and (c) good employment conditions and human resource management practices. In theory, these conditions can allow for a cycle of sustained high demand and the supply of highly skilled labor.

At the other end is the low skills equilibrium – where low supply of skills and low demand become entrenched and investment and aspiration are kept nominal. This, Froy notes, is a particularly common problem in rural areas. Attempts to remedy this often fall flat and create additional problems, particularly when policy is focused on boosting skills supply by training up people for the labor market. Without the demand for skilled jobs, such efforts tend to result in a high proportion of labor market entrants choosing to migrate to different regions in search of better career opportunities, therefore creating basic labor shortages – not enough people to meet the established demand for lower skilled jobs. Subsequently, policymakers are likely to become preoccupied with the immediate problems of basic labor shortages, rather than developing a balanced economy capable of long-term sustained growth. Froy & Giguere (2010) use this to illustrate that unless investments in up-skilling local populations are coupled with efforts to improve general business and employment conditions, and demand for skills, the benefits of these improved skills levels tend to be felt elsewhere, as the highly skilled emigrate in search of better opportunities. This is what would be termed a skills surplus.

Skills shortages – where there are not enough skilled workers to meet employers needs – and skills gaps – the distance between workers' skill sets and employers' skills needs – are probably the most widely discussed of the four categories. Shortages and gaps manifest themselves in quite different ways depending on the setting. Urban areas, for example, show a tendency towards skills polarization: a large proportion of the population with high levels of education and skills alongside a large proportion with very low levels, and relatively little in between. In these circumstances, a possible short-term solution is to attract migrant workers with the relevant skills to fill the gaps. Longer term solutions often focus on promoting career pathways and supporting training for low skilled workers to up-skill while simultaneously stimulating demand for intermediate level skilled work. Similar approaches are often employed for longer term solutions to low skills equilibriums.

In an investigation into what Singapore, China, the United Kingdom, Norway and Germany are doing to match the supply of skills with current and projected skills needs Jack Keating (2008) found that these countries use a mixture of three types of strategies to attempt to align the supply of skills with current and future needs: state regulated; regulated through agreements between the social partners, that is, industry, unions and government; and market regulation. These countries recognize that investments in: (i) high-level skills are an effective contribution to productivity, (ii) low-level skills reduce social inequities, (iii) intermediate-level skills address unemployment, and (iv) school-level VET means lowest opportunity costs.

For a well-skilled future, TVET needs to be tailored to the emerging labor market. This requires planning or steering the supply of skills to meet current and future skills needs of industry by taking measures designed to better align the supply of training with the demand for skills, such as the recognition of informal learning, national qualifications frameworks and competency-based approaches.

This issue of meeting skills needs is located in a market that has three main sets of actors: employers, current and future workers, and government and its agencies. In an ideal context, the market should balance supply and demand, with employers and workers investing in skills to the level that meets their respective needs as judged by the respective returns of productivity gains and wage increases. However, training markets are imperfect, as training systems are subject to other demands and interventions, and productivity and wage levels are also influenced by other factors. Therefore, virtually all countries have some form of government intervention, frequently in conjunction with industry partners, in their national training or skills development systems. Broadly, the mechanisms used can be located within three sets

of strategies: (i) state planning and associated interventions; (ii) the use of the key elements of 'civil society', which in most cases are industry and employers, or the 'social partners'; and (iii) the market.

All countries use a mixture of these strategies and they typically implement them through a number of mechanisms, which include: (a) government agencies, such as training authorities, and employer-led councils or boards at national and regional level, with various degrees of authority to regulate and allocate public training funds; (b) national, regional and industry sectoral agencies, which typically are responsible for setting industry skills standards, and other advisory and quasi-regulatory roles; (c) incentives for individuals and enterprises, such as individual learning accounts that encourage investment in training, taxation incentives for individuals and enterprises, and training levies on enterprises; (d) information and intelligence on future skills needs and shortages at national and regional level, which are gathered and analyzed by central or regional agencies; (e) innovations in funding systems which allow decisions about the type, timing and location of training away from the providers; and (f) qualifications systems that are designed to influence investment in training by individuals and enterprises.

The Keating report has attempted to construct VET system types through the selection of five different countries. The five models are: (i) Central planning model (Singapore) tending to defy a general trend against central economic and social planning and moving towards a concentration on high skills; (ii) High involvement and devolved model (Norway) – a typical example of the social partnership model and of the strong presence of vocational training in the schools sector; (iii) Social and economic integration model (Germany): with huge investment in intermediate skills facing major pressures over the past two decades and raising major policy challenges; (iv) Mixed model (England) employing a highly complex and dynamic mixture of market-based approaches and multiple planning agencies; and (v) Institutional but market-based model (China) with dynamic manufacturing-based economy of Guangdong province producing a huge demand for intermediate skills. Each of the types or sets of approaches has its own strengths and weaknesses. In the light of the above discussion the following measures are pertinent to overcoming skills imbalances in Bangladesh:

(i) Ensuring availability of in-depth labor market information (LMI) and data: The quality and quantity of accurate LMI is a crucial asset for informed decision making on how and where to invest in training programs, to identify relevant skills necessary in the labor market, and even to inform curriculum development. LMI is a key issue which is holding back policy makers to take proactive approach to tackling skills issue. National government has the responsibility to ensure that disaggregated data are available for as many dimensions of the skills issues as possible. Capacity building is also necessary to ensure that actors both understand current and future trends within labor market and can strategically plan the best means of responding to skills imbalances. Lots of information about jobs and job seekers are either unavailable or under-utilized. To this end, analyzing vacancies can improve information about demand for labor and skills, and encouraging job seekers to register with public employment service (PES) can improve information about labor and skills supply.

(ii) Improving school-industry partnership in skill development of TVET students for matching skills demand: Partnerships with employers can improve the quality and timeliness of information and aid placements and training. To this end, there is a need for identification of potential partners through: (a) clustering different types of enterprises; (b) contacting employers associations, chambers or similar bodies; and (c) identifying situations that provide occasions for contacting employers and developing routines for visits. Preparing skills training programs that will suit the school academic calendar, granting visit to industries, industry personnel participating in special lectures, narrowing the gap between theory and practice and improving collaboration between school and industry through periodic meeting on technological innovations are among the strategies for improving school-industry partnership. Based on the findings, recommendations may be made which include: industry should understand the partnership with school on Student Industrial Work Experience Scheme (SIWES) and industry exposure to achieve

quality skills development and institutions should ensure that good communication exist with the industry. In addition, there is a need for organizing the employment services according to sectors of the economy.

(iii) Anticipatory approaches: Preparedness for tomorrow's labor markets is essential. To this end, regular employer surveys should be developed focusing more on short-medium term future plans and needs. Simultaneously, national and supranational sources should be better utilized.

(iv) Innovative approaches: Innovative approaches to skills matching require knowledge about the nature of skills supply and demand. This requires (a) skills profiling and categorization which enables targeting of offers, (b) use of LMI to improve self-matching, and (c) targeting LMI to job seekers' needs.

(v) Approaches to skills adjustment: Obsolete skills is a challenge everywhere. To this end, labor market training should target demands in the labor market by involving employers in partnerships with training institutions. At the policy level, budgets should be allocated for training according to labor market relevance.

By and large, prioritization of challenges and continuous improvement is required for employment services to employers, regular analysis of job vacancies to be used for LMI, guidance and counseling to focus more on demand for labor and skills and profiling of jobseekers aiding targeting of services. Besides, labor market training should focus more on workplace learning. However, growing numbers of policymakers and businesses across the world have advocated a focus on developing more agile skills systems where generic and transferable skills help people adapt to unpredictable conditions.

V. Understanding of the Government's Policy and Interventions in the Development of TVET

For the development of skills development in the country the Government of Bangladesh (GOB) has undertaken a large number of policies and programs in the development of TVET over time. Substantial changes have taken place in the overall skills development system including legislation, administration, operation and implementation of various policies and programs. The following review presents GOB policy interventions for an improved understanding of skills and TVET development.

V.1 TVET Reforms Project

TVET Reforms Project (11 December 2007–10 December 2015) of the International Labour Organization (ILO, 2015) spearheaded a paradigm shift in the key policy initiatives of the government resulting in the creation of (i) National Skills Development Policy-2011, (ii) National Technical and Vocational Qualification Framework (NTVQF), (iii) National Skills Development Council (NSDC) with Executive Committee of the NSDC and NSDC Secretariat. For improving the quality and relevance of TVET, several landmark changes were made. Most important among them are: (a) enhanced skills training, (b) NTVQF implementation manual, (c)

National quality assurance system, and (d) twelve new NTVQF programs – first ever. Number of programs are expanding.

Bangladesh Technical Education Board (BTEB) operates Management Information System for the NTVQF. NTVQF enables mobility of qualifications. NTVQF certificates are issued at registered training organizations. Records are kept on BTEB MIS for NTVQF. Employers can check picture of certificate holder and certificate.

The National Technical and Vocational Qualification Framework (NTVQF) established in 2011 under the Bangladesh Technical Education Board (BTEB), is a comprehensive, nationally consistent yet flexible framework for all qualifications in TVET in Bangladesh. Further, the National Skills Quality Assessment (NSQA) system was established to ensure the quality of demand-based skills development in Bangladesh. NTVQF's selected features are: (i) National reform agenda and strategy for skills development; (ii) Improved quality and relevance of skills development; (iii) Established more flexible and responsive delivery mechanisms that better service the needs of labor markets, individuals and the community at large; (iv) Improved access to skills development for various groups of citizens including women and people with disabilities, encourage participation in skills development by industry organizations, employers and workers, and improve skills acquisition in communities; (v) Enabled more effective planning, coordination and monitoring of skill development activities by different ministries, donors, industry, and public and private providers.

The NTVQF will expand the number of qualifications available in the country to better reflect the growing and changing occupational and skills profiles in both domestic and international labor markets. It will support stronger integration of skills training in community organizations, schools, training institutions and the workplace, by providing a common national benchmark for the naming and achievement of qualifications, up to, but not including, university degrees. It will also provide a new benchmark for the international recognition of the skills and knowledge of Bangladeshi workers, who are recognized as an increasingly important export for this country. The Bangladesh NTVQF is a nationally consistent system designed to: (a) improve the quality and consistency of nationally recognized qualifications; (b) introduce consistent naming of credentials for formal and non-formal skills based education and training; (c) provide formal recognition of workplace skills obtained in both the formal and informal economies; (d) provide high-quality skill outcomes to maintain individuals' employability and increase their productivity; (e)

improve the alignment of formal and non-formal training programs with industry requirements; (f) increase options for students by broadening program and progression pathways; and (g) support lifelong learning by providing recognized pathways for workers to raise the level of their knowledge and skills throughout their working life, and beyond.

The Bangladesh NTVQF includes two pre-vocational levels to introduce additional pathways in general education and to cater for the under privileged and low educated groups in society. It also includes five vocational levels, and one level for diploma level qualifications as shown in the Figure 5.1. Under the NTVQF, training organizations will also be able to issue a Statement of Attainment for specific units of competency when less than the full program has been completed.

In general education, a new system of dual certification is introduced so that students who satisfactorily achieve the skills component of vocational education programs such as the SSC (Voc), HSC (Voc) and HSC (BM), receive a NTVQF qualification in addition to, and separate from, the school qualification.

NTVQF Levels	Pre-Vocation 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 (NSC3)		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-Vocation Certificate NPVC 2			Pre-Vocation Trainee
Pre-Voc 1	National Pre-Vocation Certificate 1 NPVC 1			Pre-Vocation Trainee

Figure 5.1: The National Technical and Vocational Qualifications Framework of Bangladesh
Source: National Skills Development Policy-2011 and BTEB.

All government agencies that deliver skills training will review their curriculum so that it aligns with the new NTVQF. This will ensure that participants in government funded skills development programs have the opportunity to receive nationally recognized qualifications for the part of their program that is based on national industry skills standards. NGOs and other providers of non-formal skills training, including the Bureau of Non-Formal Education (BNFE), will also be encouraged to utilize the new standards and support materials so that the skills component of their programs can be nationally recognized.

Competency Standards

BTEB is a statutory body mandated to implement NTVQF through a competency based training and assessment (CBTA) system. The CBTA system supports the introduction of demand-driven training, and results in the development of partnerships between industry sectors and the training organizations. CBTA represents a shift away from traditional theory based approaches to delivery and assessment by placing greater emphasis on the achievement and demonstration of practical skills required to perform at a specified standard demanded by industry. The CBTA system is based on the following principles: (a)

Progression through a competency based training program is determined by whether the student has met the set standards, and not by the time spent in training; and (b) Each learner's achievement is measured against job-related competency standards rather than against the achievement of other learners. An important foundation for the introduction of CBTA is close dialogue with industry to develop clear descriptions of the skills and knowledge required to perform different tasks in the workplace. These units of competency, or competency standards, set the performance criteria that are assessed in training institutions who issue nationally recognized qualifications.

Competency standards are a set of benchmarks used to assess the skills and knowledge that a person must demonstrate in the workplace to be seen as competent. These benchmarks are packaged into combinations to form units of competency, which consist of Unit codes, nominal hours, range of variables, evidence guides, etc. The competency standards are the core element for training, assessment and certification of skilled workers. Candidates are guided with the competency standard to achieve a qualification aligned with the NTVQF. BTEB has been implementing CBT&A system since 2012. Since then 344 competency standards have been formulated in 155 occupations of 12 selected sectors up to June 2019. During this period BTEB has accredited 340 institutions as registered training organizations. Number of total certified graduates is detailed in Table-V.1.

Type of certified graduates	NTVQF Certification (Number)					
	Pre-Voc	Level-1	Level-2	Level-3	Level-4	NC-4
Teacher & Trainer	11	518	57	7	15	397
Industry Assessor	25	770	343	157	78	1192
Graduate (RTO)	70	18209	-	4	18	-
Graduate (RPL)	6672	28270	3128	54	7	-
Graduate (Piloting Institute)	-	727	-	-	-	-

Source: BTEB, Annual Report, 2018-19.

To ensure a smooth transition to the new system, the NTVQF is being gradually implemented and updated in twelve thrust industry sectors (agro-food, ceramic, construction, furniture, informal, ICT, leather & leather goods, light engineering, pharmaceutical, RMG, tourism & hospitality, and transport equipment) to allow development of new standards and qualifications for occupations and skills in demand.

Industry Sector Standards and Qualifications Structure:

The government with its industry partners will implement a new system of industry competency standards and qualifications. The competency standards will be developed by each industry sector and then grouped into clusters that reflect occupations or key skills sets prioritized by employers and workers in that sector. This new system will be known as the Industry Sector Standards and Qualifications Structure. Training organizations, both public and private, will not automatically be able to issue the new competency based qualifications endorsed by industry as they will be required to demonstrate they have the necessary equipment and trained staff to meet the skills standards set by industry.

Under a CBTA system, industry will be expected to increase its engagement and support of training institutions, so that programs and graduates are more likely to meet the needs of employers and their staff. Vocational education programs in schools such as the SSC (Voc), HSC (Voc) and HSC (BM) will be revised to ensure that the vocational components are based on industry competency standards and that students only receive NTVQF qualifications if they are assessed as competent. All instructors and trainers will be provided with adequate training so that they can develop and implement CBTA programs. Considerable investments will also be made to upgrade the facilities and equipment of select training

institutes so that they can deliver the new industry endorsed qualifications. The impact of CBTA will be closely monitored to ensure the opportunities for skills development available to industry and learners are not adversely affected due to additional costs.

For the first time, 5 Industry Skills Councils (ISCs) were created in Bangladesh in 2014. They were: (i) Tourism & Hospitality ISC, (ii) Agro-Food ISC, (iii) Information & Communication Technology ISC, (iv) Transport ISC, and (v) Leather & Leather Goods ISC. In addition, 3 Centers of Excellence were established. Up to June 2019, the number of ISCs had increased to 12 including 7 new sectors, namely, Construction ISC, Light Engineering ISC, Readymade Garments & Textile ISC, Furniture ISC, Informal Sector ISC, Ceramic ISC and Pharmaceutical ISC (DTE, 2019). Currently, only Agro-Food ISC, Ceramic ISC, Construction ISC, Furniture ISC, Informal Sector ISC, and Leather & Leather Goods ISC, are functioning. The rest are not functioning reportedly due to the inertia of the sectoral leaders. However, ISCs are currently playing a good role in developing trainers and assessors, and in developing competency standards, CBLMs and assessment tools.

By and large TVET Reforms Project laid down the foundations of Bangladesh's National Skills Development System (NSDS). It spelt out skills development policy strategies, systems/ processes, tools promotion adoption/replication and targets. Despite several successes, the follow-up of the project ran into a number of obstacles. Employers did not engage with sector bodies in some industries. Policy documents had largely been the work of consultants, while slow legislation had delayed implementation. Sustainability after the project relies on generous and continued donor activity and support, esp. SEIP of ADB.

V.2 Recent Developments in the Government Policy Regime

BTEB is the successor of the then statutory body, The East Pakistan Technical Education Board (EPTTEB), established through The Technical Education Act, 1967 (East Pakistan Act) (Act No. 1 of 1967) on 7 March 1967. The Act provided EPTTEB with *inter alia* the following powers and functions:

- (i) To organize, regulate, supervise, control and develop technical education;
- (ii) To prescribe courses of instruction for its examination as detailed in the Schedule to this Act;
- (iii) To grant recognition to or to withhold or withdraw recognition from educational institutions offering courses in technical education after considering inspection reports from its own Inspection Officer or Officers deputed in that behalf by the Board;
- (iv) To prescribe conditions governing admission of students to and transfer of students from one institution to another prosecuting studies under the same curricula;
- (v) To prescribe the manner and mode of inspection of institution offering technical education;
- (vi) To hold, conduct and regulate examinations on completion of course and curricula of technical education;
- (vii) To publish the results of examination held by the Board;
- (viii) To grant diplomas/certificates to persons who have passed examinations held by the Board;
- (ix) To arbitrate or arrange for arbitration in disputes between teachers and Governing Bodies or Managing Committees of institutions offering technical education; and
- (x) To do such other acts and things as it may consider necessary for the purposes of organization, regulation, supervision, control and development of technical education.

V.2.1 Bangladesh Technical Education Board Act, 2018 (Act No. LXVI of 2018)

These powers and functions of BTEB continued until 14 November 2018 on which The Technical Education Act, 1967 (East Pakistan Act) (Act No. 1 of 1967) was repealed and reenacted, and updated

by Bangladesh Technical Education Board Act, 2018 (Act No. LXVI of 2018) (GOB, 2019a; GOB, 2019b). According to this Act, the duties and functions of BTEB are as follows:

- (a) to conduct, recognize and control the technical and vocational education and training;
- (b) to determine the courses for the technical and vocational education and training within the scope of this Act and to make syllabus and curriculum for those courses;
- (c) to prepare textbooks and learning materials according to the curriculum made by the Board;
- (d) to conduct examinations of technical and vocational education and training, and to assess skill, determine fees, publish result and award certificate;
- (e) to formulate policy for admission of students in the technical and vocational education and training institutes recognized by the Board and inter-institutional transfer of the students;
- (f) to inspect, supervise and monitor the technical and vocational education and training institutes recognized by the Board;
- (g) to give recognition of prior experience within the scope of this Act;
- (h) to establish and maintain the data management system of the technical and vocational education and training institutes recognized by the Board;
- (i) to collect information related to demand of the technical and vocational education and training through the Industry Skill Council;
- (j) to prepare curriculum for competency-based training and assessment courses with the assistance of the Industrial Skill Council;
- (k) to determine the standard of qualification under the National Technical and Vocational Qualification Framework;
- (l) to award scholarship, medal or prize for the technical and vocational education and training;
- (m) to enter into agreement with any organization for carrying out the purposes of this Act: Provided that, in the case of an agreement with any foreign organization, prior approval of the Government shall have to be taken; and
- (n) such other duties as may be specified by the Government.

Power of BTEB to make regulations: (1) The Board may, with the prior approval of the Government, by notification in the official Gazette, make regulations subject to being consistent with the provisions of this Act and rules made there under, for carrying out the purposes of this Act. (2) In particular and without prejudice to the generality of the power conferred by sub-section (1), inter alia, the Board may make regulations for all or any of the following matters, namely:

- (a) determination of the qualification for appearing in the technical and vocational education and training examination and competency assessment, awarding and cancellation of certificate;
- (b) fixing fees for technical and vocational education and training examination and competency assessment;
- (c) making curriculum and courses for the technical and vocational education and training;
- (d) procedure of Recognition of Prior Learning (RPL);
- (e) conducting all examinations of the Board and competency assessment;
- (f) power and duties of the employees of the Board;
- (g) conducting the meetings of the Board and the Committees;
- (h) regulations related to conduct of the technical and vocational education and training institutes;
- (i) terms and conditions of service and code of conduct of the teachers and trainers of the technical and vocational education and training institutes;
- (j) provisions related to disputes resolutions among the teachers and the trainers of the technical and vocational education and training institutes and the managing board;
- (k) procedure and mode of inspection;
- (l) regulations for the employees of the board; and

(m) travelling allowance and honorarium of the members for attending meeting of the Board and Committee.

Meanwhile, BTEB has formulated a number of CBTA documents, namely, Competency Standards, Accreditation Documents, Competency Based Learning Materials (CBLM), Implementation Manual, CBT & curriculum framework, RPL guideline, Competency Skills Log Book (CSLB), Quality Assurance Manual and other related documents. In order to stand the test of time. BTEB has also reformulated some rules, namely, SSC (Vocational)/Dakhil (Vocational) Nitimala – 2020, HSC (BM) Nitimala – 2020, Diploma in Engineering Nitimala – 2020, Diploma in Agriculture/Fisheries Nitimala – 2020, Diploma in Textile Engineering Nitimala – 2020, and National Skills Basic (360 hours duration) Nitimala-2020.

V.2.2 National Skills Development Authority Act, 2018 (Act No. XLV of 2018)

Upon the commencement of the National Skills Development Authority Act, 2018 (Act No. XLV of 2018), the Notification No. ShaKaMo/Odhishakha-8/ja:dokkhota/2008/B-1, dated 3rd September 2008 issued by the Ministry of Labour and Employment was repealed and the National Skills Development Council (NSDC) established under it was dissolved. In order to regenerate national skills development policies and programs, National Skills Development Authority (NSDA) will work under the Governing Board and will operate with the Executive Committee of the NSDA chaired by the Executive Chairman, and NSDA Secretariat (PMO, 2019). The duties and functions of NSDA as a statutory apex body of the national skills development include:

- (i) to formulate national skill development policy, strategy and plan of action;
- (ii) to fix the Key Performance Indicator for government and non-government training institutes, prepare uniform training manual and coordinate the activities of their implementation, supervision and evaluation for the purpose of creating skilled human resources for the national and international labor market;
- (iii) to publish the forecast of the national and international labor market demand and establish sector-wise skill data bank;
- (iv) to give recognition of prior learning of professions under this Act, where applicable;
- (v) to monitor and coordinate all projects and actions related to skill development;
- (vi) to take actions to develop the standard of training, certification and mutual recognition;
- (vii) to form Industry Skill Council and provide with necessary assistance;
- (viii) to strengthen industry linkage;
- (ix) to take any initiative by the Authority on its own consideration for creating skilled human resources; and
- (x) to discharge such other duties as may be directed by the Government or the Governing Board.

Since its establishment NSDA has made rules e.g. National Skills Development Authority Rules, 2020; and developed training institute/center registration related guidelines, namely, (i) Training Institute/Center Registration Guidelines, (ii) Gazette-Training Institute/Center Registration Guidelines, and (iii) Guide to Filling-up Training Institute/Center Registration Form. Among other guidelines developed by NSDA mention can be made of (1) Guideline of Freelancing Skills Certification -2020, (2) Course Accreditation Guideline-2020, (3) Trainee Assessment Guideline-2020, (4) Assessor Assessment Guideline-2020, (5) Form for Registering in Assessor Pool, (6) Assessment Centre Registration Guideline-2020, and (7) Form for Registering as Assessment Centre. Meanwhile, NSDA has formulated NHRDF (National Human Resources Development Fund) Use Policy-2019 and Draft National Skills Development Policy, 2020.

National Skills Development Authority Rules, 2020

National Skills Development Authority Rules, 2020, relates to inter alia (i) management of the activities/programs of NSDA; (ii) national skills development policy, strategy and plan of action; (iii) indicators of work performance, uniform curriculum formulation, etc; (iv) provision of labor market forecasts; (v) establishment of Central Skill Portal; (vi) online-based training system; (vii) recognition of prior learning (RPL); (viii) monitoring and coordination of all projects and programs related to skill development; (ix) quality development of skill training; (x) certification; (xi) mutual recognition of international and regional competence system; (xii) establishment of Industry Skill Council, etc; (xiii) strengthening industry linkage; (xiv) registration of skill development training institutes; (xv) organizing national skill competition in line with international skill competition; and (xvi) creating the public awareness about skill development programs.

National Human Resources Development Fund Use Policy-2019

National Human Resources Development Fund (NHRDF) was created by the Finance Division of the Ministry of Finance in order to meet the ever-increasing need for skill development in accordance with the national and international market. The following sums were credited to NHRDF: (i) grant received from the Government, (ii) loan borrowed from any source approved by the Government, (iii) money received as registration fee, (iv) interest of money deposited in the bank, and (v) money received from any other valid source. NHRDF is registered under the Company Act, 1994. The target of NHRDF is to convert the vast masses of the population of the country into skilled human resources through education and employment-oriented training. The objectives of NHRDF Use Policy are to: (i) increase the capability of working age population and to create ability to obtain job in the competitive labor market through training by using NHRDF; (ii) build skilled workforce in accordance with the demand of the domestic and international labor market; (iii) assist to increase institutional capacity along with training of pre-employment and on-the-job training and women, less-skilled persons, disabled, migrant, displaced people inside the country, aged workers, small ethnic groups, different cultural minority class, underdeveloped, marginal and rural masses, and unemployed people; (iv) conduct re-skilling and up-skilling programs in order to adjust change of profession due to technological change and climate change; (v) train language in keeping with professional skill development; (vi) provide assistance in the accomplishment of economic development by relating productive and income-raising schemes through transformation of working age population into skilled human resource; (vii) make skill development programs demand-based, standard and speedy in terms of strengthening Industry Skill Council and Industry Association; (viii) encourage research, survey and innovative works; and (ix) undertake awareness programs with a view to motivating the youth community in skill development programs.

Draft National Skills Development Policy, 2020 (NSDP-2020)

NSDP-2020 is a timely and forward-looking national skills development policy document which makes the most of the latest developments in global technological change and skills development trends. It targets to skill up Bangladesh in keeping with most recent global trends.

There has been a paradigm shift in the skills development domain with the enactment of the National Skills Development Authority Act, 2018 and the subsequent National Skills Development Authority Rules, 2020 which placed NSDA as the linchpin of the skills ecosystem of the country. The skills development sector of the country requires effective coordination, competency-based skills training delivery mechanism and unified standard, curriculum and certification system. Rapid transformation of the economy will contribute towards realizing its goal of becoming a developed country by 2041. To this end, Bangladesh needs to sustain high growth momentum for another two decades. Since, there is a limit to the sector-led growth, the country needs to give emphasis on ways to increase productivity. Skilling of the workforce, therefore, will play a vital role in the future development of the country.

As noted earlier, the world is under the 4IR which is based on the concept of smart factory where machines are integrated with humans through cyber-physical systems (CPS). Industries are experiencing transformation and evolution towards complete digitization and the intelligence of production processes to safeguard high efficiency. In this context, the new generation of workers need to acquire new skills in automation, digitization, and information technology to cope with the changing scenarios. To achieve the country's goals, the 8th Five Year Plan, SDGs and 2nd Perspective Plan (2021-2041) are linked, inter alia, to the smooth and effective transformation of the traditional skills development system into a competency-based modern system that ensures state of art training on the cutting-edge technologies. The NSDP-2020 will be aligned with the provisions of the other important national policy documents and skill requirements of 4IR.

Pursuant to the NSDA Act, 2018 and NSDA Rules, 2020; NSDP-2020 is developed to establish a sustainable skills development ecosystem in Bangladesh. NSDA and all stakeholders will be responsible for implementation of this policy. This policy is subject to review and revisit as and when required. The National Skills Development Policy, 2020 is based on the following key principles:

(a) Shared responsibilities among various actors and stakeholders in skills training design and delivery: Various actors and stakeholders will be involved in the design and delivery of skills, re-skilling, up-skilling training and apprenticeship.

(b) Matching of skills demand and supply: The skills development system will be responsive to the labor market requirements through efficient coordination between demands for and supply of skills.

(c) Equal opportunities: This policy will cover training opportunities across all segments of society including women, people living in remote rural communities, disadvantaged youths, and persons with disabilities.

Thus, the national skills development policy is intended to be results-focused, inclusive, performance-based and forward-looking aligned with and contributing to the country's long-term development goals envisaged in SDGs, Second Perspective Plan (2021-41), Vision 2041, and Delta Plan 2100.

Skills Development Landscape in Bangladesh and Key Priorities

The skills development system in Bangladesh is vast, diverse and operated by a host of actors, stakeholders and providers; namely public, private and NGOs. The Government ministries as well as departments, NGOs and private sector organizations deliver skills training. Thus, country's skills system can be categorized as: (1) Public (delivered by the Government ministries and departments), (2) Private (commercial training organizations), (3) Non-government and not-for-profit organizations, and (4) Industry-based (organizations managed by industry and training delivered in the workplace including apprenticeships). All these training providers offer a wide variety of formal, informal and non-formal training to different target groups using different approaches and modes of delivery, assessment processes, and certification. Such types of training are largely disjointed and diverse in nature. So, for the sake of efficiency and effectiveness, it is important to rationalize these skills training interventions by putting these under a common and well-coordinated system.

Besides, the existing skills training system needs to address the issues of quality and relevance. Available evidence shows that there is significant mismatch between skills training offered and skills in demand. Lack of coordination in skills training delivery leads to a competition for the same target group of learners, limited links between different training centers and no clear picture of what training is provided for which industry or occupation.

Areas for further improvements are: (a) Establishing a credible and real-time Labor Market Information System (LMIS) for analysis of skills requirements in different sectors; (b) Developing a strong industry-institution linkage; (c) Selecting demand-driven occupations for jobs required in industry; (d) Preparing competency standards required for occupations identified; (e) Developing unified curriculums for skills development training; (f) Preparing course accreditation documents (CAD) for skills training delivery organizations to ensure infrastructure in terms of classrooms, workshops, tools, equipment, machinery, and qualified trainers; (g) Establishing skills assessment system to test competencies acquired by the trainees; and (h) Establishing a national certification system for recognition of competencies acquired by skills trainees and enhancement of their employment opportunities in-country and abroad. Necessary improvements will be made as noted above through a qualification framework.

Vision of NSDP-2020 is a demand-driven skilled workforce will be built for the socio-economic development of Bangladesh. Mission of NSDP-2020 is people's employability and competitiveness in the national and international labor markets will be increased for better earnings taking into account the importance of adaptability to the technologically changing world of work. The objectives of NSDP-2020 are: (a) to establish demand-driven, flexible and responsive training provisions; (b) to deliver skills training and to assure quality through a framework of qualifications; (c) to establish a unified skills certification system; (d) to improve coordination of skills development training; (e) to provide a wide access to skills development training for all; (f) to strengthen industry-institute linkage for demand-driven skills development and job placement; (g) to implement mutual recognition agreement (MRA) for skills development and job placement; (h) to introduce RPL mechanism for formal recognition of skills; (i) to establish a skills data system; and (j) to operate an efficient monitoring and evaluation system.

A fundamental cornerstone of Bangladesh's development plan is to promote "whole of society" approach. To this effect, the country's skills development training system will allow access to: (i) Young people including unemployed youth (male and female), working people, and self-employed workers; (ii) Marginalized groups: low-skilled people, persons with disabilities, transgender communities, internally displaced persons including those affected by climate-change, older workers, socially excluded groups of people, workers in small and medium enterprises, workers in the informal economy, persons engaged in small and medium enterprises, and people of remote and isolated areas; and (iii) Migrant groups: Potential migrants and returnee migrants including female migrants.

Experience and lessons learned from the past initiatives

Since the adoption of the NSDP 2011 and its implementation, the country's skills system has undergone an expansion and transformation. This transformation has been supported by both government and development partners.. There has been a significant shift from supply-driven to demand-driven and market-responsive skills provision. Several new initiatives were launched concurrently with the reform of the national skill system since 2009 including launching of pilot initiatives. GOB's strong focus on skills development has resulted in phenomenal increase of student enrolment in the technical and vocational stream – from 1% in 2009 to 15.2% in 2018. Despite these positive developments, the scale of interventions has not been sufficient compared to the actual needs. For example, quality and relevance of the skills training are two very important areas requiring robust measures. Other major lessons learnt following the initiation and implementation of NSDP 2011 include:

- (i) Capacity constraints of the training providers remained a major challenge and qualified and efficient training providers is prerequisite to the expansion of the demand-driven and market-responsive skills training system;
- (ii) Lack of proper coordination among the training providers in the public and private sectors resulted in varying quality of training and certification, particularly due to shortage of qualified trainers, insufficient

equipment and workshop facilities. Coordination in training and certification across the private and public domain therefore needs to be a priority;

(iii) Access to skills training by the marginalized and poorer groups, including those from the remote areas and at community levels, has remained limited. For the holistic impact of skills training throughout the nation, inclusion and access thus has to be maintained;

(iv) Skills demand data for the domestic and overseas markets, particularly for the future skills needs, is scarce and this lesson could be the basis for initiating a skills data framework for better monitoring and evidence-based responses in this sector; and

(v) Public knowledge and perception of skills training were found to be inadequate. This could be results of inadequate advocacy and mass campaigning at the national and community levels.

Skills Training for the Current and Future Labor Market Needs

The labor market of Bangladesh is characterized by a rapid labor force growth rate of 3 percent annually which is faster than the population growth rate of 1.37 percent. According to the BBS estimates, one-third of the country's entire labor force (BBS, LFS 2017-18 estimates) are young people (15 to 29 years). On an average 2.0 million people join the labor force every year. To take advantage of the country's demographic dividend, preparing the country's youth for the world of work, particularly through an effective skills development system, is one of the highest national priorities. Hence, the skills policy will specifically provide for the strategies needed to help these people with employable skills through increasing their access and participation in skills training.

On the demand side, Bangladesh has been experiencing a major transformation of its economy led by rapid growth of manufacturing and services sectors which require skilled workers. The Government has embarked upon several large-scale mega projects and is establishing 100 economic zones in phases where large scale investments are expected. If successfully implemented, these economic zones are expected to generate huge employment opportunities estimated at about 10 million new jobs by 2030.⁷ All these rapid economic transformations of the Bangladesh economy have already created or are likely to create huge demand for skilled workers in the future.

The industries in Bangladesh are undergoing transformation and evolution toward complete digitization and intelligent production processes to ensure high efficiency. The 4IR is based on the concept of smart factories where machines are integrated with humans through cyber-physical systems. So, the new workers who will face the future world of work under 4IR must have new skills in automation, digitization, and information technologies. Alongside with the above priorities, there is need to focus more on research and innovation to support sectoral skills gap analysis, emerging skills requirements, labor market forecasting, and performance monitoring and reporting.

Another area of importance is demand forecasting and enhancing skill requirements for the overseas job market. It is the GOB's expressed policy to raise the percentage of skilled workers for overseas employments. As the nature of demand in overseas markets is changing with preference for skilled workers, Bangladesh needs to prepare its workforce through investing in human resource development. This will include mutual recognition of skills between Bangladesh and the destination countries. To this effect, Ministry of Expatriates Welfare and Overseas Employment and BMET will take necessary initiatives and collaborate with NSDA and Ministry of Foreign Affairs.

To meet the demand for skilled workers in the domestic economy and overseas labor market, Bangladesh's current skills system needs to respond to those emerging industry and labor market needs.

⁷ GED: Planning Commission: Perspective Plan of Bangladesh, 2021-41, Dhaka, March. 2020.

Ministries and departments as well as the STPs in both public and private sectors will collaborate with each other for delivery of skills development training. Also, the Government will adopt strategies for policy implementation including plan of action, evaluation of the KPI for STPs, develop uniform training curriculum, publish skills demand forecast and establish sector-wise skills data system. Other important activities will be to: (a) develop and certify trainers and assessors, establish a certified trainer and assessor pool, conduct assessment and assure quality; (b) take actions for certification, equalize international certificates and take actions for MRA; (c) accredit assessment center and support the establishment of Center of Excellence (COE); (d) form and strengthen Industry Skills Council (ISC), observe, monitor, advise and coordinate the activities of ISCs and establish Industry linkage; (e) monitor and evaluate the skills development system, monitor skills development project and programs taken by different ministries and agencies, and establish skills data system; (f) conduct research, survey, census, study to match demand and supply of skills; (g) support the use of NHRDF for the financing of skills development; (h) provide Recognition of Prior Learning (RPL); (i) classify jobs; (j) provide award for the development of teaching aids, content, machinery and quality improvement methods by arranging competition; (k) establish forums, committees, working groups and taskforces for skills development; (l) coordinate the activities of STPs; and (m) develop awareness about skills development.

Key features of NSDP-2020 may be described as follows:

Skills development for emerging technologies including 4IR and digital skills

An important objective of the Government is to develop a digital system to ensure that services are delivered efficiently in an effort to transform the country into a knowledge-based society by 2041 (National ICT Policy 2018, Sections 2.1 & 2.2). To this end, the Government would like to build up ICT-based skilled human resources through training and by generating employment opportunities. As manufacturing and services sectors are growing rapidly, Bangladesh adopts the new technologies and production processes including the use of digital technologies in the various sectors and sub-sectors.

Therefore, NSDP 2020 will include provisions for promoting training on digital skills and other emerging skills areas for promotion of youth employment, both domestic and overseas. In this regard, the following measures will be adopted by the skills development system: (a) Identify and assess the skill requirements including anticipation for future skills requirements and develop a digitized skills database; (b) Develop curricula and training courses to incorporate ICT-related skills in the training courses; (c) Upgrade the digital skills and knowledge of the teachers and instructors including competency required for delivery of online training where appropriate; (d) Building capacity of the STPs to deliver training on the digital and emerging technologies, online training, other kind of distant learning methods; and (e) Use of digital technologies for monitoring and assessing performance of STPs and tracking of skills graduates.

Skills Development Training relating to Climate Change Initiatives

Bangladesh has been ranked high in the risk of being affected by extreme weather events. Aware of country's climate change related vulnerabilities, the Government has adopted the Bangladesh Climate Change Strategy and Action Plan 2009 and the recent and updated long-term Delta Plan 2100. Adaptation and mitigations measures to meet the challenges of climate change include, inter alia, use of new and alternative technologies including promotion of green skills. Some examples of green skills related activities include energy saving production methods and green factories, installation and maintenance of solar home systems, bio-gas, waste management and recycling, effluent treatment plants, eco-tourism, organic production practices, and other emerging areas. In this regard, NSDA and the key stakeholders including Ministry of Environment and Forest, Department of Environment and Forest, NGO and civil society groups, international and UN organizations, and other stakeholders will identify emerging green skills which are in demand. Depending on the assessment of demand for

emerging green skills, training courses will be developed and introduced in the various training centers, where possible.

National Skills Qualification Framework (NSQF)

Through the adoption of NSDA Act 2018 and NSDA Rules 2020, NSDA has got the mandate for skills development in the country by way of coordination, quality assurance, and assessment and certification. Pursuant to the said Act and Rules as well as this policy, skills development training and quality assurance will be guided by National Skills Qualification Framework (NSQF). NSQF distinguishes ten skills levels detailed in Figure-5.2. This framework is subject to the endorsement by Executive Committee of NSDA. The Executive Committee will decide on its review and updating as and when required.

Figure-5.2: National Skills Qualification Framework

NSQF LEVELS	Descriptor			
	Knowledge	Technique	Occupational Responsibilities	Job Classification
NSQF Level 10	Acquire mastery of theme and innovation; analyze, compare and summarize critical understanding and thinking of the work and theme; think situations differently; provide innovative and creative contribution to knowledge and process of work through observation, study, research and motivate up keeping mission and vision.	Facilitate appropriate techniques to develop strategic plan/policies; carry out extensive research and study; show performance to provide creative and innovative contribution and future planning.	Responsible for decision making in complex and innovative situations. Carry out and or guide on work and technical activities in unpredictable situations; responsible for short, medium and long term future plan.	Specialists
NSQF Level 9	Provide information for innovative, creative and dynamic solutions; apply critical thinking and intellectual talent on personnel management in a broader context; maintain value system to control organization as a whole.	Apply appropriate techniques to develop strategic plan/policies; Apply effective communication techniques with external and internal periphery; represent organization as a whole; facilitate to develop innovative and dynamic solutions for specific and abstract problems in multiple sector; practice intellectual talent to evaluate and control whole organizational activities; prepare and apply techniques for budgetary control.	Responsible for whole organization. Directs, evaluate and control the organization as a whole to implement short, medium and long term future plan. Control resources, expenditures and budget.	Chiefs
NSQF Level 8	Use information for innovative creative solutions in a wider range; apply principles	Apply effective communication and presentation techniques in a wider	Responsible for multiple departments or whole enterprise. Exercises executive	Senior Managers

Descriptor				
NSQF LEVELS	Knowledge	Technique	Occupational Responsibilities	Job Classification
	of management in a broader context; maintain value system to control behavior of teams; maintain a pervasive, consistent, and predictable behavior.	context; apply techniques to develop creative and innovative solutions for specific and abstract problems in multiple sector; practice intellectual independence; control managerial activities; apply techniques to implement strategic plans to achieve objectives.	functions in a wider range. Directs and motivates managers to achieve goals and objectives; control resources and expenditures.	
NSQF Level 7	Use information for innovative solutions; apply principles of management; maintain value system to control behavior of the team; maintain a pervasive, consistent, and predictable behavior.	Apply effective communication and presentation techniques; apply techniques to develop creative solutions for specific and abstract problems; practice intellectual independence; control workplace activities in a smart way; apply motivational techniques to achieve objectives.	Responsible for a department or whole enterprise. Exercises managerial functions. Supervise and motivate employees to achieve goals and objectives. Provide direction of the progress of an organization. Control resources and expenditures.	Managers
NSQF Level 6	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria; organize values into priorities; resolve conflicts at workplace; analyze, compare, relate and evaluate values.	Use wider range of techniques according to situation; suggest critical and creative techniques; perform job/tasks in a range of situations.	Execute work plans. Disseminate information to lower management. Inspire and provide guidance to low-level management and teams. Diagnose and resolve problems within and among work groups.	Mid Level Manager
NSQF Level 5	Scrutinize and break information into parts by identifying motives or causes. Make inferences and find evidences to support generalizations; maintain workplace values with more complex state of commitment.	Apply techniques to perform duties with complex situation; practice critical and creative thinking to guide the performance of the team under his/her jurisdiction; use information and communication technologies; maintain communication to achieve time bound objectives.	Bridge between higher level management and skilled employees. Give instructions and/or orders to lower level staffs. Responsible for the work and actions of team members.	Supervisor
NSQF Level 4	Possess a range of cognitive, affective requirements; solve problems to new	Apply wide range of innovative and creative techniques to perform works in	Work efficiently with team and lead the team.	Highly Skilled worker

Descriptor				
NSQF LEVELS	Knowledge	Technique	Occupational Responsibilities	Job Classification
	situations by comparing and applying acquired knowledge, facts, techniques and rules in a different way; maintain professional values.	response to workplace requirements; lead a team for effective performance as per workplace requirements.	Apply techniques and traits in response to workplace requirements.	
NSQF Level 3	Recognition of facts and ideas by organizing, interpreting, giving descriptions, and stating main ideas; maintain workplace values and culture.	Apply techniques to perform works using appropriate tools and equipment by recognizing the requirements of workplace settings and upholding the values and culture of the workplace.	Work efficiently through exercising considerable independent judgments. Discharge duties with responsibility. Possess a thorough and comprehensive knowledge and techniques of the occupation s/he is employed.	Skilled worker
NSQF Level 2	Interpret and apply occupational terms and instructions; maintain awareness, attentiveness, responsiveness and punctuality.	Communicate at workplace with required clarity; apply technique for calculations, show performance to do the job; work in a team; and exchange views and feedback of others.	Do work generally of defined routine nature with necessary skills for proper discharge of work assigned and little judgments. Work under supervision with limited scope of manipulation.	Semi Skilled worker
NSQF Level 1	Interpret common occupational terms and instructions; state required occupational tools, materials and their use; maintain awareness, willingness to hear, responsive to selected attention etc.	Apply techniques to perform specific works showing competencies using required tools and equipment by interpreting occupational terms and instructions applying OSH within guided work environment/ under supervision.	Limited range of responsibilities to carry out tasks under supervision.	Basic Skilled worker

Source: NSDA, 2020.

Skills Quality Assurance Mechanism

The benefits of a skills quality assurance mechanism are obvious. Establishment and functioning of such a mechanism is to ensure that the skills training providers (STPs) meet the standards related to the workplace requirements. Over time, all the agencies delivering skills training will become accredited under the set criteria so that learners can receive formal recognition of skills acquired through the NSQF-determined learning outcomes. This will ultimately lead to the credibility of the certificates and better employment outcomes of the jobseekers at home and abroad. Ultimately, the skills training will be systematic and effective. Thus, an effective quality assurance mechanism will include: (a) registration of STPs; (b) preparation of competency standards, CAD, curriculums, instructor's manual, etc; (c) a skills framework having units of competencies and qualifications; (d) accreditation of training and assessment

programs; (e) certification of trainers and assessors; (f) auditing of training providers for compliance with quality standards; (g) validation of assessment tools against units of competencies (e.g. standardized examinations and practical tests); and (h) development and publication of quality procedures and manuals and its effective implementations.

Competency-based Training and Assessment (CBT&A)

The CBT&A system is intended to support the introduction of demand-driven skills development training keeping the relevant stakeholders in the loop. It represents a shift from the traditional theory-based approaches to the practical skills through competency-based training required by industry. Two key principles of the CBT&A system include: (a) Progression or graduation through the training delivery that will determine whether the trainees have met the set standards or competencies required by particular occupations; and not by the time spent in training sessions; and (b) Achievements of the trainees are measured against the job-related competency standards. Under the CBT&A, a close collaboration with industry is needed to develop clear descriptors of knowledge and technique constituting skill for performance of specific tasks at workplaces. The units of competencies or competency standards set the performance criteria that will be assessed in STPs in line with the existing skills development qualifications framework.

Skills Training Quality Assurance: Improved quality of training will increase the productivity and competitiveness of the skilled graduates. Good quality training will enhance the employability of the graduates and make skills development a more attractive option for the young people and thus benefits the community at large. Improved quality is also necessary so that the employers at home and abroad can be assured that qualifications assessed truly reflect the standard of skills that they claim. Skills development training will be assessed against a framework of qualifications so that learners can receive formal recognition of their skills acquired. NSDA will lead the implementation of the NSQF.

Role of the Key Agencies

(1) National Skills Development Authority (NSDA): NSDA started its journey from February 2019 and has a broad-based membership in its Governing Body that includes almost all the government ministries delivering skills training and selected representatives from the private sector and organizations of employers and employees. The NSDA Act 2018 empowers this new Authority with a wide-ranging responsibilities and tasks with regard to coordination, quality assurance and certification.

(2) The Government Ministries and Departments: There are 23 ministries and 35 departments under these ministries providing skills training of various types (TVET Institution Census 2015). Notable among these are: Finance Division, Technical and Madrasah Education Division, Ministry of Expatriates' Welfare and Overseas Employment, Ministry of Youth and Sports, ICT Division, Ministry of Women and Children Affairs, Ministry of Social Welfare, Ministry of Industries, Ministry of Labour and Employment, Ministry of Agriculture, Ministry of Fisheries and Livestock, Ministry of Jute and Textiles, Rural Development and Cooperative Division.

(3) Industry Skills Councils (ISCs): The ISCs have been established to ensure industry collaboration in skills development. ISCs will establish Centers of Excellence (CoE) which will practice and promote the best model of skills in the industry sector. They will also be research hubs for conducting research and survey to provide information on skills demand, priority occupations, technological transformation and scope of job opportunities. Furthermore, ISCs will help in strengthening industry linkage, apprenticeship program, up-skilling and re-skilling, RPL, standard and curriculum development, assessment of trainees, trainers and assessors. To this effect, separate guidelines will be developed for implementations.

(4) Non-Government Organizations (NGO): NGOs will provide skills development in collaboration with NSDA and the relevant stakeholders.

Improving Access and Outreach to Underserved Areas

Expanding outreach and improving access of skills training are two important areas of focus of this policy. It will strengthen the institutional capacity for increasing access and coordinate with local and community-level organizations for delivery of skills training. Specifically, these may include interventions in the following areas: (a) Expansion of workplace-based skills training like apprenticeship, on-the-job training and industry attachments; (b) Support to the existing training providers or establishment of new ones which will work to improve access to the marginalized groups and to reach out to the people of geographically isolated communities; (c) Increasing the outreach of the skills system to remote areas and underserved communities; (d) Providing necessary support to STPs through need assessment; (e) Working with the various government agencies which expand network of training at the district or Upazila levels, for example, DTE, Department of Youth, Department of Women Affairs and Department of Social Services as well as local NGOs and private sector training providers; (f) Strengthening capacity of the existing STPs to deliver training following appropriate curriculum and learning materials; and (g) Support to the area-based skills demand data collection and deliver skills training focusing on the needs of the marginalized communities.

Improving access of the Marginalized Groups

(i) Marginalized People: It is important that marginalized people are provided with greater access to appropriate and quality skills development training. To ensure this, the national skills development system will provide: (a) Pathways for the marginalized people into the formal training system including apprenticeships and RPL; (b) Offer specially-designed courses such as IT-related skills, job-related skills development, and entrepreneurship skills leading to gainful employment opportunities after training; (c) Introduce flexible shifts for the delivery of courses; (d) Allow reasonable adjustment to procedures related to assessment and RPL; (e) Ensure safe and congenial learning environment; and (f) Support STPs to introduce courses for the marginalized people during and after training such as career counseling, job placement and other post-training services.

(ii) Women: Given the current slow progress in participation of women in skills development, special efforts and proactive measures are necessary to correct this gender imbalance, particularly in formal training system. To address this, the Government has adopted a strategy for gender mainstreaming in TVET. Specific measures to increase female participation in the skills program will include: (i) Offering a broader range of traditional & non-traditional skills training programs that could improve the employability of women; (ii) Reviewing programs and their delivery modes to make them gender friendly; (iii) Increasing female enrollment rates in skills development programs through pro-active measures such as hostel facilities, stipends for the students from the poorer families, relaxing admission criteria, and providing a gender-friendly environment for female students; (iv) Providing separate wash rooms for male & female trainees; (v) Employing female instructors where possible; (vi) Implementing a workplace harassment prevention policy in training institutions; (vii) Ensuring all instructors and managers undergo gender awareness, workplace harassment prevention and equal employment opportunities in training; and (viii) Providing a system where all trainees have access to counseling services.

(iii) Persons with Disabilities: The Rights and Protection of Persons with Disabilities Act 2013 calls for action to improve opportunities for persons with disabilities through increasing their access and privileges and participation in skills development programs. The Government approved a national strategy for inclusion of persons with disabilities in skills development training. There are also examples where private

sector employers have pro-actively come forward to support training and employment of persons with disabilities. For increasing access of persons with disabilities in skills training, specific measures may include: (a) Strategy for inclusion of persons with disabilities will be implemented; (b) Institutional facilities will be upgraded to provide access to training for the disabled trainees; (c) Managers and instructors of training institutions will receive training on how to work with trainees with disabilities; (d) Efforts will be made to advocate for, engage and encourage the ISCs and private sector employers to have special provisions for persons with disabilities in employment through appropriate job-oriented training; (e) Customized curriculum and delivery methods will be developed for people with disabilities in priority occupations and skill sets; (f) Reasonable accommodation will be made in delivery and assessment; and (g) Persons with disabilities will have access to counseling on training and employment options; and familiarization training on employment.

(iv) People in Less Developed Areas and People in Rural Communities: To increase participation of the marginalized groups in the socio-economic development activities, the Government pro-actively encourages greater access of these groups, namely people from haors (wetlands), chars (shoals) and poverty-stricken areas, to such developmental activities including skills development training. Given the large rural population in Bangladesh, efforts will be made to improve the quality of skills development training in rural communities, and where relevant, strengthen links between formal and informal skills training. To achieve this, the community-based training for rural economic empowerment will: (i) target the key rural industries e.g. agriculture, livestock, fisheries and handicrafts, as well as provide skills relevant to rural infrastructure and the development of a range of community services; (ii) develop specially designed courses for increased employment opportunities for the under-privileged groups in their localities; (iii) provide linkages to formal skills training institutions to upgrade or gain further training; (iv) include a support mechanism for trainees during training and post-training periods that will address future employment and training options; and (v) create gender-friendly environment.

(v) Informal Workers: STPs will include the informal economy workers for their skills development in a flexible manner. The workers beyond the purview of STPs will fall under the RPL mechanism for skills certification. Quality assurance and certification will be ensured for these workers.

Provision of Apprenticeship for employment

Apprenticeship is a well-known and time-tested workplace-based training modality. It is an effective way for preparing people for the world of work and addressing unemployment. The NSDA Rules 2020 defines apprenticeship as follows: “Apprenticeship” is a particular method of skills training through which an employer signs a contract to employ one or more persons as apprentice (s) and train them in systematic way in an industry or training institution in any occupation for predetermined period of time.

Apprenticeship increases quality of training as training is delivered hands-on at the workplace under the supervision of the industries’ staff and employers. Therefore, this type of workplace-based training improves the employability of trainees and supplies the industries with steady flow of skilled workers. Currently, the legal provision for apprenticeship is provided in the Labour Act 2006 (section XVIII) and its amendment in 2013.

Apprenticeship training has been supported by the GOB under several development projects. However, the experience of implementation of the apprenticeship has shown that such efforts have been piecemeal in the past and the scale of expansion of apprenticeship by the agencies has remained insignificant compared to the vast needs of the country and millions of jobseekers. Measures for expansion of apprenticeship will cover the following areas: (a) Support strong institutional development for management, registration, supervisions, and certification of apprenticeship; (b) Link apprenticeship initiatives with employment opportunities in the Government entities, STPs, ISCs, industry associations,

NGOs and other stakeholders; (c) Develop and implement appropriate mechanisms and incentives to encourage and increase apprenticeships by the employers; (d) Sensitize young people to the idea of taking up apprenticeships; (e) Follow the CBT&A system for apprenticeships during training delivery occurring both on and off the job; (f) Explore the potentials of making apprenticeships available at all levels of the NSQF through ISCs and industry associations in all industry sectors; and (g) All state-owned enterprises will include apprenticeships in line with their apprenticeship provisions. Furthermore, to promote expansion of apprenticeships, necessary support will be provided to ISCs, NGOs and industries. A guideline will be developed to: (i) Set out agreed minimum rates of pay, working conditions and duration of the apprenticeships; (ii) Lead to mutually-understood contracts between the employers and the apprentices; (iii) Identify the skills or competencies to be gained on the job; or at a training center or a combination of both during the apprenticeship periods; (iv) Maintain a skills logbook to record the competencies gained through apprenticeship at workplaces where training is delivered; and (v) Award apprentices with certificates after assessment. To this effect, the apprenticeship provisions of the relevant agencies will be reviewed and be updated, if required, through mutual consultations.

Entrepreneurship in Skills Development Training

As the number of formal jobs is limited compared to the number of job seekers, alternative occupations in the form of entrepreneurships (mostly for self-employment) is now a widely accepted option for the young people. A good example is the freelancing modality and start-ups using online platforms and digital technologies which has become an emerging area with high growth potentials. So, the skills development system will include necessary components for entrepreneurships training. To this effect, the GOB has adopted several policies of which important ones include National Industrial Policy, 2016; National Youth Policy, 2017; National ICT Policy, 2018; and SME Policy, 2019. The skills development policy will be supportive of the relevant provisions of these important national policies. Thus, skills development for entrepreneurship will include: (a) collaboration among the relevant bodies like the Ministry of Industries, BSCIC, SME Foundation, employer associations, and private sector in delivering training related to entrepreneurship development; (b) components for entrepreneurship competency; (c) collaboration between the two sets of training providers namely those providing skills training and those engaged in entrepreneurship development; and (d) possible change in the curricula to have some units of competencies of entrepreneurship in the existing skills development training.

Re-skilling, Up-skilling and Lifelong Learning (LLL)

Rapid technological changes including use of digital technologies, ever-increasing trends of remote work, digitization of businesses and commerce, and spectacular growth of technology-based occupations will make profound impact on the labor market including on the skills requirements for the old as well as new workers. As a result, demand for existing skills sets are constantly being replaced by new skills sets. There are redundancies of skills among the already employed workers and there is need to prepare the young people with the emerging skills.

Due to COVID-19 millions of jobs have been lost, hundreds of thousands of businesses and factories have been shut down, and overall production process and economic activities have been severely affected due to lockdowns. Bangladesh is no exception to these trends. However, some new opportunities have been created through technology-based occupations including those related to use of digital technologies, ecommerce, more and more use of digital financial services, and greater use of online and distant learning using digital technologies. As a result, new types of skills and learning methods have become ever more important for the existing workers who have become redundant in terms of their existing skills and those entering the labor market as part of the overall human resources development. Thus, re-skilling and up-skilling of the existing workers have become important as a part of their lifelong learning. For successful implementation of an effective lifelong learning ecosystem, active engagement

and coordinated efforts of governments, employers and workers as well as educational institutions is required.

To address the re-skilling and up-skilling needs and to institutionalize the lifelong learning at the national level, Bangladesh's skills development training needs to prepare and organize itself with necessary resources, staff capacity and policy options. To start with, one important step will be to identify the groups of workers in need of re-skilling and up-skilling. Usually, they include low-skilled workers of all ages, old workers who are newly unemployed, informal workers, including women, minority communities, returnee migrant workers or internal migrants, refugees, people with disabilities etc. To respond to the above situations, the stakeholders will adopt following specific measures: (i) To conduct survey and needs assessment to find out the re-skilling and up-skilling requirements of the various groups; (ii) To identify the target groups requiring re-skilling and up-skilling; (iii) To identify and anticipate the types of labor market opportunities available to prioritize groups, and to identify the gaps between the skills held and skills needed; (iv) To provide career counseling and guidance; and (v) To institutionalize re-skilling, up-skilling and lifelong learning among the selected institutions;

Recognition of Prior Learning

A newly-emerging area where RPL is relevant is to support the country's large number of freelancers and startups through a nationally-recognized assessment. The freelancers are mostly self-employed young people engaged in e-commerce and other kinds of services using digital technologies and online platform. There are about half a million freelancers in the country (2020 estimates). This number is likely to increase as the economy thrives and the demand for such technology-based services continues to increase. Assessing and certifying the freelancers through RPL mechanism will ensure formal recognition of their skills and competencies gained; and thus pave the way for the development of their entrepreneurship potentials. As a result, the prospects for job creation for the young people will grow and the country will benefit through increased exports of such services.

As per the NSDA Act (Section 6(1) (d), and based on the successful examples and implementation modalities by the past initiatives, RPL will be scaled up to reach out to the greater number of workers, migrant workers and returnee migrants. Appropriate guidelines will be prepared in collaboration with the partner agencies and training providers to ensure that: (a) People will have the opportunity to have their skills formally recognized. The recognition process will include assessment of the incumbents' job-related knowledge and demonstrated skills gained through formal or informal training, through paid or unpaid works, or via life experiences or a combination of these; (b) The recognition will be conducted against the competencies and qualifications described in the existing qualifications framework for skills certification; (c) Reasonable accommodations will be made to cater to those who are illiterate, have a disability or low education levels, provided that they demonstrate their skills at the required levels; and (d) The certificate holders will have the opportunity to enter the formal training programs for enhancement of their skills. Guidelines will be developed as and when required for smooth and proper implementations of the RPL mechanism.

Skills Development for Overseas Employment

For the future, the government would like to increase the flow of overseas employment with greater proportion of skilled workers and maximize remittance earnings. An issue of concern for policy makers is the relatively high percentage of low-skilled migrant workers from Bangladesh. Specific measures in this regard will include: collection of accurate information on demand for the skilled workers in the overseas labor markets; expansion of RPL to cover migrant workers including female migrants; strengthening capacity of the STPs to deliver quality training that meets the requirements of the overseas employers;

and make concerted efforts by the various agencies for recognition of certificates by the overseas employers.

Mutual Recognition Agreement (MRA) with Global Partners

The main objective of MRA with Global Partners is to adopt best practices across the world. This kind of agreement will immensely benefit domestic training programs by enhancing their quality through learning from successful international models of skills development training. The Governments, corporate bodies and agencies from abroad will be encouraged to collaborate in design of competency standards, curricula, CBLM and delivery of training. Exchange and capacity building programs for trainers, administrators and trainees will be facilitated. The scheme will also institutionalize the process of skills development of emigrant workers and to equip them with the basic knowledge about laws, language, and culture of the destination countries. Besides skills, Bangladeshi workers face other problems like inadequate information and lack of knowledge of basic language. Often they have to work in adverse circumstances because of unfavorable terms of employment. As the nature of demand in overseas markets is changing with preference for more skilled workers, Bangladesh needs to prepare its workforce through investing in human resource development. This will include mutual recognition of skills between Bangladesh and the destination countries. Furthermore, to contribute to the increased percentage of skilled workers for overseas jobs, the relevant agencies will:

- (a) Carry out stakeholder consultations with government institutions, multinational employers, and in-country officials of Embassies of key labor destination countries. Such consultations will help the GOB to understand the dynamics of labor migration patterns, employment trends, employment prospects of the high-demand occupations, key challenges and bottlenecks associated with hiring skilled workers from Bangladesh and international recognition of skills certification;
- (b) Help promote an improved skills development training to enable training and placement of more skilled workers on overseas jobs. In this regard, Bangladesh will take the advantage of growing skills shortages to be faced by the ageing population of the developed world and will tap potentials to supply skilled workers to the overseas labor markets; and
- (c) Conduct research for continuous identification of countries; trades and occupations where skills shortages exist or are likely to develop.

Role of Industry sector in Skills Development

For the sake of increasing the greater employability of the skills graduates, industry participation in the skills development training needs to be increased. Such industry participation includes, inter alia, formation of Industry Skills Councils (ISCs), expansion of apprenticeships, contributions to competency-based curriculum development, establishing center of excellence, public private partnership (PPP), and demand forecasting for skills. The ISCs will be established and registered under the Company Act 1994. The role of ISCs will cover the following: (i) To develop linkage between industry and STPs; (ii) To support identification of occupations in demand by the industries; (iii) To contribute to the development of competency standards, CAD and curriculums; (iv) To forecast the industry's demand for skills; (v) To support skill-gap analysis periodically that will guide the STPs in re-skilling and up-skilling of the existing workforce; (vi) To support expansion of apprenticeships; (vii) To promote PPPs in skills development; and (viii) A guideline will be developed for operationalization of ISCs.

Strengthening linkage between Skills Training Providers and Industries through ISCs and Industry Associations (IAs)

Ideally, a sound skill development system actively promotes close collaboration between the skills training institutions and industries. In this regard, necessary measures will be adopted to facilitate such

industry-institution linkage through mobilizing the ISCs and IAs. Also, a sound skills development system promotes skills development training that takes place in the training institutions and the specialized on-the-job training in the industries. Strong industry-institution linkage is a necessity to ensure a steady flow of skilled and productive workers. Such linkage is not a one-sided affair. On the contrary, it is a kind of partnership to work for a common goal of developing human resources. It is not only confined to provide on-the-job training by the industry experts but also to include industry cooperation right from the planning stage to the job placement of the trainees. In this regard, memorandum of understandings (MOUs) between STPs and industries is necessary as the STPs will be sure of its trainees being absorbed in the industry. This would benefit the trainees of the institutions in obtaining effective training in reputed organizations. It will expose the trainees to the latest technologies. Trainees will gain experience in a real work environment that will raise their prospects of finding jobs after training. Besides training in the institutions, it is important to allow young people the opportunity to learn skills on the job. For this reason, linkages between training institutions and industries are critical in determining the outcomes of skills development training. Benefits of institution-industry co-operation include: (a) job placement of the skills graduates; (b) information exchange between institutions and industries on current practices; (c) on-the-job training, work experience and apprenticeships; (d) career guidance, counseling and job placement support; and (e) supply of skilled workers for quality production in industry.

Skills Development is a Shared Responsibility

Skills development is a shared responsibility among a number of actors playing their respective roles towards a well-functioning national skills development training. The actors include NSDA, various Government Ministries and Departments delivering skills training, public sector training providers, private sector training providers and not-for-profit or NGO training providers, ISCs, trade bodies and, employers' organizations like Bangladesh Employers Federation and employees associations. Appropriate measures will be put in place to ensure that all the agencies play their due role towards a sound skills development system that: (i) aligns with the national goals and objectives; (ii) promotes jobs for the country's youth; and (iii) supports rapid human resources needs of the rapidly growing economy.

Effective and Flexible Institutional Management

Institutional framework and governance structure of the skills development training have undergone a major reshuffle with the adoption of the NSDA Act 2018 and NSDA Rules 2020. An effective institutional framework is required for a demand-driven and inclusive skills development training. Important tasks are: (a) Enhancing capacity of the training providers to improve their managerial capacities and to respond to emerging needs of the labor markets such as collecting and generating accurate and credible skills data; (b) Promoting a flexible approach to training delivery to suit the needs of the various target groups, local economy and the isolated rural communities; (c) Specifying provisions for transparency and accountability of the training providers (public & private sectors) in line with the stated objectives of the skills development policy; and (d) Assessing the key performance indicators (KPIs) for skills development training.

Enhancing Implementation Capacities of the Key Agencies

Many of the key challenges facing skills development in Bangladesh derive from the current structure and management of the skills development system including the STPs; public and private sectors and NGOs. These are: limited inter-agency coordination, poor linkages between the STPs and the labor markets, insufficient capacity of the various agencies, piecemeal regulations and quality assurance, and limited planning and delivery of training including at local and community levels. To address the above challenges, KPIs will be developed for the STPs to measure their compliance with the pre-determined performance indicators. Other important measures will include the following: (i) Prepare, implement and

follow up on a skills development action plan; (ii) Coordinate the provisions of skills development delivered by different Government Ministries, private sector providers, and NGOs; (iii) Promote decentralization of skills training delivery and introduce specific mechanisms to improve coordination of skills development training at Division, District and Upazilla levels; and (iv) Support establishment of Skills Development Consultative Committees at each Division under a guideline.

Capacity Building for Skills Development Training

Skills development eco-system aims to establish a skills-based and technologically-oriented competent society to ensure that every person has access to skills training that will provide necessary knowledge and techniques to meet their occupational needs in a competitive world of work. To this effect, a consultative forum comprising of the industry as well as private sector experts and technical training managers will be built up to support the analysis of skills gaps, selection of need-based occupations, development of standards, curricula, competency-based learning materials (CBLM), assessment tools and quality assurance mechanisms. A small group of master trainers will be formed from the consultative forum. This small group of master trainers involved in curricula and CBLM development will subsequently support the capacity building of the trainers and assessors for smooth and effective training delivery and quality assurance. If required, arrangements will be made for certification of the master trainers.

Establishing an Effective Monitoring and Evaluation System

As skills development needs to respond to the dynamic and ever-changing requirements of the rapidly changing economy, it is of immense importance that the NSDP-2020 will undergo periodic reviews and revisions to maintain its relevance. This is even more important considering the fact that (a) the number of training institutes, particularly in the private sector, has expanded rapidly (about 43% between 2008 and 2015) and (b) currently, there are 13,163 training institutions in the country (TVET Institute Census 2015). About 87 percent of these institutes are in the private sector and quality of training in most of these institutes requires improvements through monitoring & evaluation. For improving the current situations, the national skills development system in the country will carry out following tasks relating to monitoring and evaluation: (a) Prepare Key Performance Indicators (KPI) for STPs; (b) Establish a sound system of regular monitoring, reporting and evaluation of the skills development initiatives; (c) Undertake a good assessment of the performance of the STPs; (d) Monitor activities of ISCs; (e) Carry out regular monitoring and evaluation; (f) Develop an online system for tracking the skills graduates; and (g) Monitor the implementation progress of skills development action plan.

Review of implementation progress of the various initiatives under this policy will be carried out. For smooth conduct of such review, regular consultations with the stakeholders will be organized to obtain feedback and make improvements. Assessment will be undertaken to ensure that the targets are met well within the set time frame. For this purpose, indicators will be developed and used in the assessment process.

Monitoring and Coordination of Projects and Programs related to Skills Development Training

(i) Need for a holistic approach for the national skill development training: A number of skills development training projects operate in the public and private sectors. Quite often, the projects are implemented in a disjointed manner; and, on many occasions, overlaps take place. Thus, (a) information on the national and international labor markets demand for skills remains fragmented; (b) there is a lack of consistency in the training quality; and (c) priorities for implementation of the skills initiatives are determined on a piecemeal rather than systematic basis. This policy is, therefore, expected to ensure that appropriate measures are in place for a holistic approach to skills development training.

(ii) Improved coordination of skills development training initiatives: To avoid the pitfalls of the current system, Section 6 (1) (e) of the NSDA Act, 2018 mandated NSDA “to monitor and coordinate projects and programs related to skills Development training.” In this regard, the steps to be taken are: (a) To issue a circular to all the concerned stakeholders mentioning the details of how to monitor and coordinate the projects and programs and what actions are needed at the time of initiating and designing new projects on skills development training; (b) To implement a monitoring, evaluation and coordination system for performance measurement and further improvements; and (c) To formulate and implement a set of comprehensive guidelines for monitoring and evaluation of the activities related to the effective use of NHRDF.

Skills and Labor Market Data for Planning and Monitoring

Quality data are crucial for effective management, planning and delivery of a sound skills development training. Without accurate data for skills demand, the Government, employers, training providers and other stakeholders find it difficult to take informed decisions about what skills are required and what programs should be delivered, when and where. Accurate skills training data are also important to assess new opportunities for workers whose skills sets may be affected by the technological changes. Quantitative and qualitative forecasting of skills demand will be linked to the broad national development strategies with systems put in place to track sectors and regions having high growth potentials, new employment prospects and skills requirements. The skills training development data system will be strengthened to provide timely and accurate information to all stakeholders. The system will: (a) Address the data needs related to the supply of skills, the demand for skills, and the matching of supply and demand in public and private sectors; (b) Address the data needs related to the demand for skills by trades/occupations in key international labor markets; (c) Identify skills shortage and potential demands for skills both at the international, regional and national levels; (d) Increase the use of tracer studies to track the employability of the skilled graduates; (e) Provide information on the training courses and programs offered by STPs; and (f) Raise awareness on labor rights and obligations. To make it efficient and useful, the skills training data system will collect information and inputs from the industry sector, STPs both at public, private and NGOs, BBS, ministries and agencies providing skills development training. For the overseas employment-related information, MOEWOE/BMET is responsible for coordination of international skills demand data. The MOEWOE/BMET will share the data with the relevant stakeholders for decision-making on skills development training.

National Skills Portal

As per section 6(1) (c) of NSDA Act 2018, developing and commissioning a robust National Skills Portal (NSP) is very important. The NSP will contain national and international skills demand and supply related data with monitoring and reporting provisions under dynamic formats. It will have a number of important modules that will contain the following information: registration of institutes, training course accreditation, trainee’s enrollment, training delivery mechanism, assessment process, certification, pool of trainers and assessors, training materials like curricula, competency standards, guidelines, skills demand, job placement, and graduates tracking system. To ensure that, the NSP will be updated and customized depending on its requirements for augmentation and exclusion. Potential trainees, job seekers, national and international employers, public and private agencies, and NGOs will benefit from NSP. Furthermore, the unemployed workforce, especially young jobseekers and disadvantaged groups, will be able to do job matching with their skills and be able to actively engage in the mainstream national economy.

Promoting Skills Development Training

To raise the status of skills development training, partnerships between Government, employers, workers and the private sector is the imperative. The actors will work together for popularization of skills

development training. Representatives of the Government, employers and labor organizations need to jointly promote the development and recognition of skills development training and the need for necessary investment in this area. The GOB will initiate dialogue with the partners and stakeholders to raise awareness of skills development among people. Advocacy and social marketing of skills development training may include the following: (i) Organize campaigns and competitions involving all stakeholders to increase enrollment in skills development training; (ii) Participate in the national and international conferences, meetings, workshops and seminars; (iii) Organize skills fair and introduce national awards for skilled workers; (iv) Organize workshops and seminars at the local level with the parents, community leaders and local employers, civil society organizations, and labor organizations to popularize skills development training; and (v) Observe World Youth Skills Day.

Specific measures for popularizing skills development training and ensuring greater participation of people will include the following: (a) Strengthen local training capacity and institutions (both public & private) to enable them to introduce demand-based skills training courses and include wider section of population in these courses; (b) Ensure better co-ordination of skill development training at the local level; (c) Popularize and expand RPL mechanisms and apprenticeships at the national and local levels and undertake necessary measures such as (i) identification of occupation-wise population groups; (ii) assessment of qualifications of the skilled persons at the local level; and (iii) ensuring participation of industries in these initiatives; (d) Greater participation and access to skills development training for the disadvantaged people to promote wage and self-employment; (e) Increasing the level of awareness on NSDP, 2020 at the local level will be organized with support of the local authorities. In addition, electronic and print media may be used to reach out to the various groups of stakeholders; (f) Extend financial support to poorer groups including women, unemployed youth and people in the rural areas; and (g) Flexible training delivery system needs to be introduced to ensure participation of women, freelancers and rural people in skill development training.

Participation in Skills Development Training: It is important that the country's skills development training needs to (a) reach out to a greater number of the population than before; and (b) include a broad-based participation by the members of various socio-economic groups including the freelancers and the marginalized groups.

Research, Survey and Study on Skills Development Training: It is important to focus on research, survey and study that will reveal the trends in the labor market, skills in demand in the domestic and overseas labor markets, and adoption of the new and emerging technologies and integration and use of ICT in the skills development training. Collaboration among the various stakeholders and agencies will be pursued: (i) to identify prospective areas of research, study and assessment; (ii) to prepare manual and guidelines for research; and (iii) to develop a regular system to publish and disseminate the key findings and recommendations of the reports of the surveys, researches, studies etc. in an effort to popularize and raise awareness among the people about skills development training.

Financing Provisions for Skills Development Training: The provision for financing the skills development training plays an important role in enhancing the effectiveness and efficiency of the training. Funding for skills development training will be provided from the budgetary provisions of the STPs.

(i) NSDA's Fund Provisions: According to the NSDA Act, 2018; the Authority has a fund consisting of the following sources: (a) Grants received from the Government; (b) Loans borrowed from any source approved by the Government; (c) Money received as registration fees; (d) Interest of money deposited in the bank; and (e) Money received from any other valid sources.

(ii) NHRDF Provisions: There is a fund, known as NHRDF which has been set up by the Finance Division, Ministry of Finance under the Company Act 1994 to provide support towards the skills development

training. NSDA has been tasked with selecting candidates for NHRDF disbursement by Finance Division under policy guidelines.

A Forward-looking Skills Development Training Policy

The NSDP-2020 will be a forward-looking policy responding to the rapidly changing socioeconomic scenarios of Bangladesh and its transition towards a knowledge-based society. These changing scenarios are: demographic transition and its impact on the labor markets characterized by ever-increasing number of young jobseekers; emergence of new technologies and production processes including 4IR that will necessitate re-skilling, up-skilling and lifelong learning opportunities for the population; increased trade and investment generating demand for skilled workers at both home and abroad; and response to climate change and future of work requiring knowledge and skills for adaptation to new technologies. Necessary adjustments are needed to address the emerging trends. The GOB has committed to SDGs and targets towards becoming a developed country by 2041. To achieve the objectives, the skills development training needs to address the following areas: **(i) Focus on ensuring quality and relevance of skills development training and strengthen linkage with the industry and private sector in design and delivery of skills development training:** It is necessary to match demand and supply of skills and improve labor market data; and maintain the employability of workers. **(ii) Alignment with the SDGs:** It will include quality and relevance of skill development training. **(iii) Technological change, re-skilling, up-skilling and lifelong learning:** In line with SDG-4 on “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”, focus will be given on re-skilling, up-skilling and lifelong learning opportunities for all. **(iv) A well-functioning and results-focused skills development training:** This can be achieved through a realistic action plan for implementation of this policy with a monitoring and evaluation system put in place.

A strategic and time-bound Action Plan involving all stakeholders will be formulated for smooth and proper implementation of NSDP-2020.

V.3 Revisiting Overall TVET Policy and Regulatory Environment

Bangladesh has overcome some of the deep-rooted challenges related to TVET through the improvement of the legislative and policy framework. National Skills Development Policy (NSDP) 2011 provided a national vision and direction for skills development and put a more concrete emphasis on three areas of focus: quality, equity and access, and governance. National Education Policy (NEP) 2010 provides a strategic approach to vocational and technical education to build up skilled manpower. Non-Formal Education Act (NFEA), 2014 focuses on *inter alia* opening up opportunities for lifelong learning and developing competence for self-employment. NSDA Act 2018 and BTEB Act 2018 are in line with the same goal. But the interface of the policy and regulatory framework still remains a grey area. The NSDA Act, BTEB Act, and the NFE Act have some issues to be further clarified in line with the mandates and capacity of the respective authority. Issues that need immediate attention, are related to the RPL certification, training impartation, certification and accreditation of training providers.

NEP-2010 lays the guidelines of achieving the aims and objectives of vocational and technical education: (i) to increase competent manpower in diverse sectors including Information and Communication Technology (ICT) at a fast pace keeping in mind the national and international demands; (ii) to build up skilled manpower at a fast pace to create opportunities of economic development and to increase dignity of labor; and (iii) to create wide-ranging employment opportunities through export of skilled manpower and to enhance foreign currency earnings. However, NEP-2010 has no provision for a unified National Skills Qualification Framework (NSQF), which, however, has been included in the Draft NSDP-2020.

Gaps related to legislations, and institutional arrangements: The two acts, recently promulgated, i.e. the Bangladesh Technical Education Board Act, 2018 and the National Skills Development Authority Act 2018 are landmark policy, regulatory and institutional initiative of the GOB to further the development of TVET in Bangladesh. Notwithstanding this, there remains a number of duplication of activities, mandates and expectations from the two organizations. The areas mainly relate to NSDA's role in training impartation, certification and accreditation of training providers, which ideally should be performed by BTEB (Khan, 2019).

NSDP-2011 was a landmark policy document for skills development providing a good framework to prepare Bangladesh for transition from what it calls a “low skills, low productivity and low wage equilibrium” to a “high skill, high productivity and high wage” virtuous cycle by expanding the frontiers of growth with strategic investments in human resource development. It emphasizes (i) establishing a national human resource development fund (NHRDF) to sustainably finance the scaling-up of quality skills development to meet current and future labor market needs; (ii) strengthening coordination between key institutions involved in skills development by building on the initiatives of the erstwhile NSDC; (iii) establishing a robust quality assurance framework through a partnership between the BTEB and ISCs; (iv) catalyzing the private sector on a large-scale and promoting PPP to make the skills development programs much more responsive; (v) targeting disadvantaged groups by various mechanisms; and (vi) enhancing sector-wide monitoring.

NSDP-2011 has been revised and updated by Draft NSDP-2020 to bring it close to the emerging conditions and demand of the sector. As regards its implementation, skills development for the poor should be promoted with substantial expansion of effective apprenticeship policy, and introduction of short courses, to be more frequently accessed by those with <US\$1 daily earning. In the Action Plan attention must be given to improving quality and market responsiveness of the policies and strategies so that earnings and working conditions can improve for the participants.

One of the major policy challenges is creating “decent work” – moving from present average earning of less than or only close to average per capita income even for those with formal TVET to better wages and work conditions. International experience suggests steps to build stronger “foundational skills” through basic general education, “transferable skills” through secondary education and TVET and “job specific skills” along with soft skills through high quality TVET and apprenticeship. These skills building measures need to be combined with complementary policy interventions in labor market and social protection for workers.

The other vital policy issues relate to concrete alignment of SDGs and its targets related to skills development, readiness to 4IR, infrastructures, learning facilities etc. and how instructional approaches and practices both in TVET and general education have to be changed ensuring a threshold of resources to guarantee the application of acceptable quality criteria. Establishing quality standards and applying them in programs are necessary conditions for success and can in no way be neglected.

Transformation of TVET needs to address the problem of skills mismatch which originates from a combination of two factors: (a) deficiencies in basic foundational skills arising from primary and secondary education quality and the quality of vocational training on offer, and (b) inadequate market linkages characterized by a limited participation of the employers in designing training. Moreover, the TVET system as it exists has not yet developed the capacity to address the skills need of the informal sector which accounts for about 85.1 percent of total employment with 89.9 percent in the industrial sector (LFS, 2016-17).

Another area of concern and policy weakness is the lack of a sufficient and systematic effort to prepare workers for overseas employment and raise their skills profile to improve their earning and working

condition. According to BMET sources, 700159 workers (595,373 male and 104,786 female) were employed overseas in 2019. Their remittance in 2019 has topped record high US\$ 18.4 billion, ensuring a healthy foreign currency reserve for the country. The large majority of these workers, however, are of low skills, thus working with low wages and in vulnerable conditions. For ensuring demand-supply matching for migrant workers from Bangladesh in terms of skills and competencies, it is necessary to develop relevant training structures that will be responsive to the needs of the international labor market.

The national skills development policy and legislative framework also establishes responsibilities for government bodies to oversee technical training centers and accreditation programs and assess and certify trainee skills. However, the government lacks the human and financial resources to operate technical training centers. The functional capacity of these agencies to manage trainees information and to assess skills at the local level are limited. This is also a combination of policy, financing and monitoring issues.

Leadership and commitment on the part of national policy and decision-makers are needed to overcome the conventional fragmented approach of government operations and policy making to enhance the possibility of a comprehensive and coordinated approach to skills development. The NSDA, with its mandate to implement the NSDP, has a special role in this respect, especially in its role as a statutory and apex body. NSDA's role needs to be more carefully crafted and agreed by all actors in the skills development strategy. Also important is the need to clarify the areas of duplication in the two legislations (the NSDA Act and the BTEB Act, 2018). For example, Clause 8 of the BTEB Act mandates BTEB to provide Recognition of Prior Learning (RPL), while the NSDA Act's clause 6 allows NSDA to do the same where applicable. Both legislations allow the respective organizations to be involved in training quality improvement, certification and mutual recognition. NSDA being the apex body for coordination and overall quality direction, its micro-level involvement may not only create confusion, but also could jeopardize its apex role. BTEB has provided RPL certification at the NTVQF pre-vocational level to 9000 employees during 2012–2015. BTEB has stopped this since the NFEA-2014 assigns BNFE to do this certification.

Management and Governance

Effective multilevel governance in the TVET sector in Bangladesh points to the need for inclusive vertical and horizontal interactions between stakeholders and linked to the increased effectiveness, efficiency, coherence, transparency, accountability and performance of TVET policies and systems. The following are the key areas pertaining to governance and management of TVET in Bangladesh:

Although the NTVQF has been approved by the government, the implementation of the NTVQF is still limited because of the absence of relevant government orders to apply it and because of the limited awareness of the employers regarding the Bangladesh NTVQF. However, NSQF is going to be in place. One of the key policy options in relation to NSQF is a unified approach that will include all sectors of education and training with one national authority.

BTEB remains the only body responsible for the implementation of NTVQF and quality assurance of TVET through accreditation of training providers, curriculum development, examinations, and certification. But majority of TVET institutions still remain outside the jurisdiction of BTEB. The challenge lies, firstly, in bringing all TVET institutions under BTEB control, and secondly, in the rolling out of the NTVQF and NSQF as early as feasible, and through which, the establishment of a flexible, open, accessible and responsive system for workforce development, and putting in place a strong industry leadership across the whole economy.

BTEB requires, among others, resources to develop and expand CBT courses. DTE and BTEB lack capacity related to results-based planning and monitoring, reporting, and financial management. There is also a very limited decentralization and delegation of power at the local level empowering the public TVET providers at the local level for local resource planning, industry engagement and PPP. Other sectoral bodies like ISCs, and COEs are yet to be fully functional and effective within renewed and reinvigorated NSDP-2020 framework.

VI. Findings and Policy Recommendations

VI.1 Findings

The stock of supply of skills by the TVET institutions in Bangladesh is primarily provided by four TVET streams: (i) Diploma Program, (ii) HSC (Voc)/BM, (iii) SSC/Dakhil (Voc), and (iv) National Skills Standard (NSS) Basic Course. According to TVET Institution Census 2015, there are 13163 TVET institutions in the country of which 55 percent are urban and 45 percent rural. Dhaka Division accounts for the largest proportion of TVET institutions followed by Rajshahi Division and Chittagong Division. By ownership, the share of individually/family owned institutions figures most prominently followed by MPO institutions and public institutions. Existing TVET institutions produced 1743 thousand graduates in 2015 with overwhelmingly highest proportion in NSS Basic course (77.2%). TVET institutions who are offering these courses usually conduct training as many shifts as they can accommodate.

Distribution of TVET graduates by trade in 2015 are as follows: For diploma graduates, electrical engineers account for the largest share followed by civil engineers and computer engineers. Garments & clothing, laboratory technicians, agricultural and electronics engineers and garments design & pattern making are also important trades in this highest echelon of TVET stream. For HSC (Voc)/BM graduates, computer operation and maintenance figures most prominently followed by secretarial science and accounting. Among other important trades in this stream are entrepreneurship development and banking. For the SSC/Dakhil (Voc) graduates the most important trades are: computer & information technology, general mechanics, general electrical works and dress making. In the lowest echelon of TVET stream, computer operation/programming emerges as the single most important trade accounting for 42.24 percent of the NSS Basic graduates. Among other remarkable trades in this stream are graphics design & multimedia programming, database programming, dress making & tailoring and hardware & networking. However, unclassified trades in this stream comes out the highest (15.8%) of all streams concealing a large number of trades.

TVET is strongly promoted in Bangladesh as a measure to fight youth unemployment. It enables job seekers a head start in the labor market. However, TVET degrees become obsolete sooner and leave older workers vulnerable to technological change. Keeping these things in mind, attempt has been made to make a projection of skills supply in Bangladesh.

Estimated trend rates of growth of BTEB approved graduates over the period 2011–2019 are: 8.16 for Diploma graduates, 4.01 for HSC (voc)/BM graduates, 2.38 for SSC/Dakhil (voc) graduates and 19.75 for NSS Basic graduates. The average trend rate of growth of all TVET graduates is consistent with the GDP growth rate of the country and is most likely to continue into the future over the period 2020–2030.

The total supply of TVET graduates in the country is estimated at 8.8 million in 2025 (with 292,342 Diploma, 174,206 HSC Voc/BM, 186,071 SSC/Dakhil Voc and 8,157,564 NSSB) as well as at 20.9 million in 2030 (with 432,737 Diploma, 212,050 HSC Voc/BM, 209,291 SSC/Dakhil Voc and 20,088,067 NSSB) indicating that it would more than double every five years. This is more likely to be the situation in the country because capacity building of the TVET institutions and especially NSS Basic courses are being generously supported by the donors, esp. by SEIP of ADB.

BTEB – the only statutory body to ensure TVET certification – approves TVET courses only in 42.3 percent of the training institutions, while a larger share of the non-BTEB institutions have their own curricula. This speaks of the prevalence of a wide variety of course curricula followed by TVET institutions. Unqualified teachers mostly and in some cases government officials with little or no exposure to the world of work still tend to prepare and set curricula. Thus the gap between the TVET training

system and employment needs and opportunities keeps widening and uniform quality and standard is not created and embedded into TVET telling heavily upon the effectiveness of TVET.

Curriculum is not available in about one-third of TVET institutions. However, BTEB is fully equipped with qualified curriculum development staff with a full-time Director and an outfit of a number of Curriculum Specialists in all the four TVET streams in order to make the curricula relevant to market demand. But such specialists are nonexistent in the non-BTEB TVET institutions. There is an inadequacy of workplace curriculum that is current, accessible and able to be implemented in the workplace. Training curriculum is characterized by inadequate linkage with industry standards and required work practices.

In terms of general education, largest proportion of the TVET teachers are masters closely followed by bachelors. In terms of level of technical education, largest proportion of the TVET teachers have qualification of trade courses followed by specialized training in TVET and Diploma in Engineering. TVET institutions are in crisis of teachers in terms of not only number but also their competence in delivering skills. Besides, the TVET teachers are not trained in pedagogy, and have very limited practical skills and industrial experience.

As regards infrastructure, on average only 8.9 percent of the institutions provide hostel facilities to the students. Class rooms account for the largest share followed by other rooms and labs. Equipment necessary for skills training specific to given jobs in the existing training curriculum are not available at about one-third of the institutions. In general, TVET institutions have very poor infrastructure.

Only 24.4 percent of TVET institutions have industrial attachment. Among them non-MPO institutions figures most prominently followed by MPO, foreign/joint venture and corporate/ trustee institutions. TVET institutions under individual ownership which account for the largest share of total institutions have the least proportion of industrial attachments. In this regard, public sector institutions fare worse than all other types of institutions except those individually owned. The largest proportion of the TVET institutions (55.9%) practicing hands-on training of their students in the industries have a duration of 1–3 months followed by less than one month (19.4%) and 3–6 months (16.3%) reflecting inadequate school-industry linkage in terms of duration. Up to June 2019 there are 260 institute-industry linkages and 119 industry-based trained teachers in the BTEB approved institutions. Nationally only 8.4 percent of TVET institutions provide job placement facility which, however, is increasing exponentially due to SEIP contribution. Job placement facility is much higher in the urban than in the rural areas.

Skills mismatch is rather enormous on average ranging from 10.89 percent to 50 percent. This effect is present both in the short- and longer term indicating that the effects of TVET on the probability of being mismatched are persistent. The effect of TVET on qualification mismatch appears to be driven mainly by a lower probability of under-qualification and higher probability of over-qualification.

Among the diploma trades, skills mismatch figures most prominently in electro-medical and mining & mine survey followed by environmental, civil and civil wood. Among the HSC graduates, skills mismatch is most critical in the case of fish culture & breeding (100%) followed by computer operation & maintenance, agro machinery, refrigeration & air-conditioning and welding & fabrication. Among the SSC graduates, skills mismatch is most critical in the case of agro-machinery, electronics control & communication, and refrigeration & air-conditioning (100% each) followed by fish culture & breeding, and welding & fabrication and clothing & garments finishing. Among the short course graduates, most prominent skills mismatches are found in plumbing & pipe fitting, welding & fabrication, and carpentry cum wood work machine operation. There is no incidence of skills mismatch in the case of CNC machine operation and web designing. BIDS survey, however, finds that skills mismatch has significantly narrowed down most recently.

TVET graduates are in great demand in the labor market. Overall, they account for 53.9 percent of the total number of technical staff and workers employed by the employers in different sectors. Largest proportion of them are employed in the manufacturing of construction products (92.8%) followed in order by education, solar power, trading of agricultural products, manufacture of electrical products and electrical products services.

Across type of technical staff employed there exists wide variation in the demand for TVET graduates. All the diploma engineers employed in education, solar power, services other than medical and electrical, and trading of agricultural products, are TVET graduates. Overwhelming majority of the TVET diploma graduates are employed in IT, garments, real estate/construction, manufacturing of electrical products, agro processing, electrical products service and medical service. TVET technicians are in great demand only in education and solar power. Demand for TVET technicians is non-existent in the manufacture of medical equipment, medical services and agro processing. As for the workers, largest share of the TVET graduates is found in the manufacture of electrical products (89.5%) followed by education and electrical products.

Almost all of the employers are satisfied on the performance of the TVET graduates. Only a few in real estate and other sectors are not satisfied. It means that TVET graduates are faring well across the board. In the same vein, almost all of the employers have full confidence in the competence of the TVET graduates who are both trainable and adaptable. There is no divided opinion among the employers in the manufacturing of electrical products and medical equipment, architecture firms, trading of agricultural products and production of solar power.

The quality and effectiveness of TVET training is hampered by: (i) lack of trained teachers, (ii) lack of in-service training opportunities, (iii) absence of quality of teaching and learning outcomes, (iv) high vacancy rate for teaching positions in public training institutions, (v) curriculum updating not adequately adaptive and overreliance on written examination, (vi) overemphasis on theory in teaching and testing rather than on practical instructions, (vii) inadequate financing coupled with use of old-fashioned equipment and training materials, and (viii) poor labor market research and weak linkage with the industries.

There is persistence of low skills equilibrium or a “low-skill path”, where the competitiveness of companies is basically based on a low-price product strategy and the low wages of workers. Measures pertinent to overcoming skills imbalances are: (i) ensuring availability of in-depth LMI and data; (ii) improving school-industry partnership; (iii) anticipatory approaches – preparedness for tomorrow’s labor markets; (iv) innovative approaches to skills matching which need knowledge about the nature of skills supply and demand requiring (a) skills profiling and categorization, (b) use of LMI to improve self-matching, and (c) targeting LMI to job seekers’ needs; and (v) approaches to skills adjustment to overcome skills obsolescence.

Development strategy based on improved quality and availability of TVET can engender a virtuous circle in which skills development fuels innovation, productivity increase and enterprise development, technological change and competitiveness that are needed to sustain and accelerate the creation of more and better jobs.

For the development of skills development in the country the GOB has undertaken a large number of policies and programs in the development of TVET over time. Substantial changes have taken place in the overall skills development system including legislation, administration, operation and implementation of various policies and programs. TVET Reforms Project spearheaded a paradigm shift in the key policy initiatives of the GOB resulting in the creation of (i) NSDP-2011, (ii) NTVQF, and (iii) NSDC. For improving the quality and relevance of TVET, several landmark changes were made. Most important among them are: (a) enhanced skills training, (b) NTVQF implementation manual, (c) National quality assurance

system, and (d) twelve new NTVQF programs – first ever. Number of programs are expanding. The NTVQF established in 2011 under the BTEB, is a comprehensive, nationally consistent yet flexible framework for all qualifications in TVET in Bangladesh. Further, the National Skills Quality Assessment (NSQA) system was established to ensure the quality of demand-based skills development in Bangladesh.

Bangladesh has overcome some of the deep-rooted challenges related to TVET through the improvement of the legislative and policy framework. NSDP-2011 provides a national vision and direction for skills development and puts a more concrete emphasis on three areas of focus: quality, equity and access, and governance. NEP-2010 provides a strategic approach to vocational and technical education to build up skilled manpower. NFEA-2014 focuses on *inter alia* opening up opportunities for lifelong learning and developing competence for self-employment. NSDA Act 2018 and BTEB Act 2018 are in line with the same goal. Most recently, NSDA has drafted NSDP-2020 which updates NSDP-2011. But the interface of these policy and regulatory interventions still remains a grey area. The NSDA Act, BTEB Act, and the NFE Act have some issues to be further clarified in line with the mandates and capacity of the respective authority. Issues are related to the RPL certification, training impartation, certification and accreditation of training providers.

One of the major policy challenges is creating “decent work” – moving from present average earning of less than or only close to average per capita income even for those with formal TVET to better wages and work conditions. This points to the need for steps to build stronger “foundational skills” through basic general education, “transferrable skills” through secondary education and TVET and “job specific skills” along with soft skills through high quality TVET and apprenticeship. These skills building measures need to be combined with complementary policy intervention in labor market and social protection for workers.

The other vital policy issues relate to concrete alignment of SDGs related to skills development, readiness to 4IR, infrastructures, learning facilities etc. and, instructional approaches and practices both in TVET and general education have to be changed ensuring a threshold of resources to guarantee the application of acceptable quality criteria. Establishing quality standards and applying them in programs are necessary conditions for success and cannot be neglected. Recent policy initiatives, however, show some concrete results in transforming TVET to address the problem of a mismatch between skills and jobs. The problem originates from: (a) deficiencies in basic foundational skills arising from primary and secondary education quality and the quality of vocational training on offer, and (b) inadequate market linkages characterized by a limited participation of the employers in designing training. However, the TVET system has developed the capacity to address the skills need of the informal sector which accounts for about 85.1 percent of total employment.

Another area of concern and policy weakness is the lack of a sufficient and systematic effort to prepare workers for overseas employment and raise their skills profile to improve their earning and working condition. The large majority of these workers are low-skilled and working with low wages and in vulnerable conditions. For ensuring demand-supply matching for migrant workers in terms of skills and competencies, it is necessary to develop relevant training structures that will respond to the needs of the international labor market.

The policy framework follows a conventional fragmented approach of operations and policy making. The NSDA, with its mandate to implement the NSDP, has a special role in this respect, especially in its role as a statutory and apex body. NSDA’s role needs to be carefully crafted and agreed by all actors in the skills development strategy. Also important is the need to clarify the areas of duplication in the two legislations (the NSDA Act and the BTEB Act, 2018). For example, Clause 8 of the BTEB Act mandates BTEB to provide RPL, while the NSDA Act’s clause 6 allows NSDA to do the same. Both legislations allow the respective organizations to be involved in training quality improvement, certification and mutual

recognition. NSDA being the apex body for coordination and overall quality direction, its micro-level involvement may not only create confusion, but also could jeopardize its apex role.

Effective multilevel governance in the TVET sector points to the need for inclusive vertical and horizontal interactions between stakeholders and linked to the increased effectiveness, efficiency, coherence, transparency, accountability and performance of TVET policies and systems. The implementation of the NTVQF is still limited because of the absence of relevant government orders to apply it and because of the limited awareness of the employers regarding the NTVQF. The draft NSQF is in place.

BTEB is the apex body responsible for the implementation of NTVQF and quality assurance of TVET through accreditation of training providers, curriculum development, examinations, and certification. But majority of TVET institutions still remain outside the jurisdiction of BTEB. The challenge lies, firstly, in bringing all TVET institutions under BTEB control, and secondly, in the rolling out of the NTVQF and NSQF as early as feasible.

BTEB requires, among others, resources to develop and expand CBT courses. DTE and BTEB lack capacity related to results-based planning and monitoring, reporting, and financial management. There is also a very limited decentralization and delegation of power at the local level empowering the public TVET providers at the local level for local resource planning, industry engagement and PPP. Other sectoral bodies like ISCs, and COEs are yet to be fully functional and effective.

VI.2 Policy Recommendations

In order to make the TVET system in Bangladesh demand-driven policy interventions in the following four main areas are required: (i) Creating partnerships between employers, government and educators through new governance arrangements; (ii) Undertaking labor market skills assessments in key economic sectors in order to direct training provision to meet labor market demand; (iii) Designing new competency-based curriculum built on the skills profiles of specific occupations; and (iv) Raising awareness of the role of employers in TVET through campaigns and other initiatives.

1. Improved matching of skills demand and supply: The skills development system needs to be responsive and relevant to labor market needs, with good coordination between demand for and supply of skills. To this end, the policy should support active and regular engagement of the social partners to reflect their needs in planning and delivering skills. Other means of improving skills matching include:

- (a) improving mechanisms for **anticipating skills demands** (current and future) and disseminating the information to inform policy making and the planning of training;
- (b) **integrating strategies** that embed skills development within broader development strategies (e.g. industry sector development, local economic development, youth employment);
- (c) strengthening **quality assurance** in delivering training, through benchmarks and criteria for providers, and certification systems that increase the value of qualifications and certificates;
- (d) enhancing **employment services** to improve the matching of jobs and skills, the collection and provision of LMI (i.e. job opportunities and skills requirements), and the linkage of that information with training;
- (e) **more flexible training provisions** in respect of both content and delivery (to include, for example, modular-based, part-time, on-the-job and/or mobile provision), possibly within a system that grants institutions greater academic and managerial autonomy while retaining centralized quality assurance and funding.

2. All policy efforts should be underpinned by continuous research: (i) Policy development and review should be supported by continuous research into various aspects of human resources development (including identifying skills needs, learning and training methodologies, identification of barriers for accessing training, and international best practice) as indicated by the ILO's Recommendation No. 195; and (ii) Continuous monitoring and evaluation of the policy's impact will provide key inputs for policy review.

Monitoring and evaluation mechanisms: Monitoring and evaluation (M&E) enables policy implementation and the impact of the policy to be objectively assessed. To this end, the policy should include provision for mid-term review, final review, and an impact assessment (normally a few years after the final year of the policy) to capture long-term effects. Methodologies range from ad hoc tracer or impact studies of particular skills programs to periodic assessments of overall policy implementation based on agreed achievement indicators. A rigorous, but also resource-intensive, approach combines: (a) assessment by external, independent institutions; (b) multi-year assessments against agreed achievement indicators; (c) both quantitative and qualitative assessments; and (d) assessments in relation to the multiple objectives of the policy (e.g. policy impact on not only economic but also social and equity concerns).

3. Meeting today's and tomorrow's skills needs: International experience shows that countries that have succeeded in linking skills development to gains in productivity, employment and development have targeted skills development policy towards three main objectives: (i) matching supply to current demand for skills – relevance and quality of training; (ii) helping workers and enterprises adjust to change – movement of workers and enterprises from declining or low-productivity activities and sectors into expanding and higher-productivity activities and sectors; and (iii) building and sustaining competencies for future labor market needs.

Matching the provision of skills with labor market demand requires LMI systems to generate, analyze and disseminate reliable sectoral and occupational information, and institutions that connect employers with training providers. It is also about equality of opportunity in access to education, training, employment services and employment, in order that the demand for training from all sectors of society is met. Learning new skills, upgrading existing ones and lifelong learning can all help workers to maintain their employability and enterprises to adapt and remain competitive. The third objective calls for a long-term perspective, anticipating the skills that will be needed in the future and engendering a virtuous circle in which more and better education and training fuels innovation, investment, technological change, economic diversification and competitiveness, and thus job growth.

4. A holistic approach to skills development encompasses (ILO, 2011a):

(A) continuous and seamless pathways of learning, starting with pre-school and primary education that adequately prepares young people for secondary and higher education and vocational training, going on to provide career guidance, LMI and counseling as young people move into the labor market, and offering workers and entrepreneurs opportunities for continuous learning to upgrade their competencies and learn new skills throughout their lives;

(B) development of core skills – including literacy, numeracy, communication skills, teamwork, problem-solving skills and learning ability – which, along with awareness of workers' rights and an understanding of entrepreneurship, are not linked to performance in specific occupations but form the building blocks for lifelong learning and adaptability to change;

(C) development of higher-level skills – professional, technical and human resource skills – enabling workers to profit from or create opportunities for high-quality and/or high-wage jobs;

(D) skills portability based first on core skills, so that workers can apply their existing knowledge and experience to new occupations or industries, and second on systems that codify, standardize, assess and certify skills, so that levels of competence can be easily recognized by social partners in different labor sectors across national, regional or international labor markets; and

(E) employability (for wage work or self-employment), which results from all these factors – a foundation composed of core skills, access to education, availability of training opportunities, motivation, ability to take advantage of opportunities for continuous learning and support in doing so, and recognition of acquired skills.

Convergence across policies: Skills and employment policies should be viewed together. The full value of one policy set is realized when it supports the objectives of the other. One of the main challenges of public policy is to foster institutional arrangements through which government departments, employers, workers and training institutions can respond effectively to changing skills and training needs, and indeed play a strategic and forward-looking role in anticipating future needs. For investments in training to yield maximum benefit to workers, enterprises and economy, country's capacity for coordination is most important in three areas: (i) connecting basic education to technical training, technical training to labor market entry, and labor market entry to workplace and lifelong learning; (ii) ensuring continuous communication between employers and training providers so that training meets the needs and aspirations of workers and enterprises; and (iii) integrating skills development policies with other policy areas.

Building Blocks of Robust Training and Skills Development Strategies and Policies: Robust training and skills strategies and policies are constructed from a number of building blocks including *inter alia* anticipating future skills needs, participation of social partners, sectoral approaches, LMI and employment services, training quality and relevance, self-employment and the informal economy, and assessing policy performance.

(1) Anticipating future skills needs: It is no longer sufficient to train workers to meet their specific current needs; we should ensure access to training programs that support lifelong skills development and focus on future market needs. It is therefore essential to be able to anticipate skills needs and to align training provision with changing needs in the labor market. This applies to change in the types and levels of skills needed as well as in occupational and technical areas. Overall, demand is growing for non-routine analytical skills involving creativity, problem-solving, communication, teamwork and entrepreneurship – all skills that help workers to maintain their employability and enterprises their resilience in the face of change. Conversely, demand is decreasing for more routine skills in functions subject to automation, digitization and outsourcing.

(2) Participation of social partners: The world of learning and the world of work are separate. One imparts learning; the other produces goods and services. But neither can thrive without the other. The art of successful skills policies is to construct sound bridges that connect the two worlds to serve both. A strong partnership between government, employers and workers is an essential feature of an effective and enduring bond between the world of learning and the world of work. This involves sound funding arrangements in order to provide the right incentives to all parties to invest in the right skills mix at the right time. It also involves the participation of employers' and workers' representatives in the design, implementation and evaluation of skills policies.

(3) Sectoral approaches: Sectoral approaches can be made most effective by: (i) basing sectoral approaches on close collaboration between the social partners at national and local levels – using bipartite or tripartite sectoral councils to match sectors' demand for skills with training provision, anticipate future labor market and skills needs, and assess the quality and relevance of training programs; (ii) recognizing each stakeholder's roles, rights and responsibilities in promoting a lifelong learning approach to meet sectors' skill needs; and (iii) embedding sectoral approaches to skills development within long-term national growth strategies, thus linking (national) top-down and (sectoral) bottom-up training strategies.

(4) LMI and employment services: LMI systems generate, update and disseminate information on current and future skills needs. This supply of critical information on an ongoing and timely basis is half the story. The other half is the transmission mechanisms that make this continuous flow of timely information available to education and training institutions, private market trainers, employers, trade unions, young people and their families, and displaced workers. Public employment services (PES) have a critical role to play in making information available in the form of career guidance, vocational counseling, and materials on access to training and job-matching services. PES help workers and employers make transitions in the labor market through job-matching services, information and access to labor market programs (on, for example, skills training or retraining, self-employment and starting a business); and they help jobseekers choose the best options to improve their individual employability, through dissemination of reliable LMI, career guidance and counseling, and a spectrum of tools and techniques to assist in searching for jobs. Private employment agencies have an increasing role to play in improving labor market functions through job-matching and the provision of advice.

(5) Training quality and relevance: A great deal of effort is required to make sure that skills development systems deliver both the quantity and the quality of training needed. This entails in the first instance an adequate supply of qualified teachers, trainers, directors of training institutions, and master crafts-persons to take on apprentices; the provision of opportunities for them to periodically upgrade their own skills; and conditions of work comparable with those in industry in order to attract the most talented staff. Well-staffed and adequately funded training institutions are essential to skills development strategies and policies. Periodic reviews may be necessary to assess their effectiveness in meeting their goals and their efficiency in using scarce resources. Existing training infrastructure needs constant innovation to keep up with new technologies and learning methods. Flexibility and agility are vital to ensure that institutions remain able to respond to the evolving challenges posed by dynamic labor markets. Training institutions must have the capacity to periodically adapt curricula and update teachers' and trainers' skills to the changing needs of the world of work. Good-quality training outcomes further depend on maintaining a high quality of training contents, methods, facilities and materials. Apprenticeships, and more generally the combination of classroom-based and work-based training, produce the best results.

(6) Self-employment and the informal economy: People working in small enterprises and in self-employment including those in the informal economy, as well as people in irregular work and precarious employment, should also have access to skills development and lifelong learning programs. Education and skills training form a logical part of a comprehensive approach to facilitating the transition of informal

activities to the formal economy. Ways of recognizing skills acquired through informal training and on-the-job experience may help workers secure better jobs.

(7) Assessing policy performance: Measuring the outcomes of skills systems and policies is essential in order to monitor and improve their effectiveness and relevance. Four key elements of a sound assessment process are: (i) quality assurance, based on employers' and trainees' feedback, to capture the labor market outcomes of training; (ii) regular and timely LMI on current demand, broken down by occupation and skills level, including early identification of sectoral trends and of changes in technology and occupations leading to changing skills composition; (iii) quantitative and qualitative forecasting of future demand for skills; and (iv) channeling of information to training providers, career guidance and employment services to enable them to adapt training provision to changing demand in the world of work.

5. Mainstreaming Sustainable Development Goals (SDGs)

Bangladesh is committed to meeting SDGs formally adopted by the United Nations General Assembly on 25 September 2015. The set of bold new 2030 Agenda focusing on 17 SDGs with 169 associated targets are a universal, integrated and transformative vision for a better world. Goal 4 of the 17 SDGs relates to TVET and skills development. The education goal – SDG 4 (“Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”) has seven targets and three strategies/means of implementation. Of the seven targets four targets which relate to TVET and skills development and employment are to:

(4.3) ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university;

(4.4) substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship;

(4.5) eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations; and

(4.7) ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

Besides, two means of implementation are: (4.b) by 2020, substantially expand the number of scholarships available for enrolment in higher education, including vocational training and ICT, technical, engineering and scientific programs; and (4.c) By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training.

Bangladesh had integrated many of the SDGs in its Seventh Five Year Plan (SFYP) covering the period 2016-2020. The lead responsibility of SDG 4 implementation had largely been accorded to the Ministry of Education. Both SDG 4 and SFYP's education agenda had quantitative and qualitative elements in their targets. The implementation period for SDG Agenda spans over 15 years and thus presents the challenges and opportunities to bring about a much-needed transformation of the education system in general and TVET in particular. The SFYP helped build the foundation for the longer view and reflect a clear sense of the destination and direction. The enrolment rate in TVET increased from 1 percent in 2009 to 16.1 percent in 2018. The number of private sector institutions is increasing, especially in the ICT sector and in response to opportunity for work abroad as skilled and semi-skilled workers in various trades. There are, however, institutional constraints.

GOB's SDG commitments in TVET are primarily focused on increasing the quantity of training opportunities so that there is equal access for all. While that is a serious consideration for the Technical and Madrasah Education Department (TMED) as reflected in the SDG Action Plan, an attention to quality, rather a balance between qualitative and quantitative aspect should be a major emphasis in the target setting, indicators and results framework for TVET in the context of SDGs. SDG4 have been realigned in the Eighth Five Year Plan (July 2020–June 2025) and the Perspective Plan of Bangladesh (2021–2041). Despite progress, there is still a long way to go. A range of policy and institutional constraints will need to be tackled during the 8FYP. PP2041 recognizes the criticality of institutions in Bangladesh's development process. Specifically, the program comprises *inter alia*: (a) Institution of a knowledge-based economy; (b) Population with 100 percent literacy rate; (c) Universal free education for up to 12 years; and (d) Flexible supply of training institutions for all who seek to acquire job-based skills.

SDG 4 seeks to ensure “inclusive and equitable quality education and promote lifelong learning opportunities for all”. Lifelong learning refers to learning that takes place across all life phases and ‘includes learning behaviors and obtaining knowledge, understanding, attitudes, values and competences for personal growth, social and economic well-being, democratic citizenship, cultural identity and employability. Besides, Target 4.7 of the SDGs signals the need to ensure that individuals contribute to sustainable development through enhancing their competencies across the learning phase.

Curriculum framework for the SDGs reinforces the connections between the SDGs through a holistic, life course approach, primary education, secondary education, TVET/skills development, tertiary education, and adult education and learning, taking into account the SDG targets and the relevant indicators. It focuses on relevance to enable the delivery of the SDGs; relevance is integral to quality of education. Systemic and institutional arrangements should be put in place for early implementation of the skills needs for green jobs in various sectors, occupational profiles, curriculum design and education and training provision for greening existing occupations and for developing emerging and new green occupations. The best that skills policy can aim for is “islands of excellence” amidst skills gaps and shortages.

6. Readiness to the Fourth Industrial Revolution (4IR)

Humankind is on the brink of 4IR driven by the confluence of a staggering range of emerging technologies. Changes in technology and commerce challenge the development of skills and capabilities. 4IR has the potential to disrupt labor markets. As automation substitutes for labor across the entire economy, the net displacement of workers by machines might exacerbate the gap between returns to capital and returns to labor. On the other hand, it is also possible that the displacement of workers by technology will, in aggregate, result in a net increase in safe and rewarding jobs. We cannot foresee at this point which scenario is likely to emerge, and history suggests that the outcome is likely to be some combination of the two. However, one thing is convincing that in the future, talent – more than capital, will represent the critical factor of production. This will give rise to a job market increasingly segregated into “low-skill/low-pay” and “high-skill/high-pay” segments, which in turn will lead to an increase in social tensions.

However, all industrial revolutions create and destroy jobs, but there is evidence that new industries are creating relatively fewer positions than in the past. Future jobs will increasingly require complex problem-solving, social and systems skills. An upward bias to skill requirements disproportionately affect older and lower-income cohorts and those working in industries most prone to automation by new technologies. Workers are increasingly turning to alternative work arrangements like side hustles, freelancing, independent contracting and gigging.

A host of factors fuel the rise of the gig economy, including increased globalization, advancements in technology and static educational and institutional inertia that cannot keep pace with changing workforce demands. It is not only the alternative workforce that is impacted by these factors. Workers in every industry will experience the transformation brought about by the 4IR, if they have not already. Approximately 50 percent of companies worldwide predict that automation will trim their current full-time workforce by 2022; and, by the same year, researchers expect at least 54 percent of employees will need re-skilling and up-skilling to complete their jobs.

4IR may indeed have the potential to “robotize” humanity and thus to deprive us of our heart and soul. It may affect inequality across economies as well as within them. In particular, the increasing flexibility of capital in the form of robots and other advanced manufacturing systems may erode the comparative advantage currently enjoyed by Bangladesh, which is focused on labor-intensive goods and services. “The brain is the next “battle space.” Talent – more than capital, will represent the critical factor of production.

An answer to this could be ‘continuous up-training’: a system that would allow every employee to devote significant time to acquiring fresh skills. Besides, two sets of strategies seem reasonable in order to prepare ourselves for these shifts. The first is to invest in building and developing skills linked to science, technology and design so that we equip the world with people able to work alongside ever-smarter machines, thus being augmented rather than replaced by technology. The second strategy is to focus more on those qualities that make us uniquely human rather than machines – in particular traits such as empathy, inspiration, belonging, creativity, resilience and sensitivity. Draft NSDP-2020 addresses this issue.

Studies show technologies like AI will eliminate some jobs, while creating demand for new jobs and skills. Some experts warn of a “winner-take-all economy,” where high-skilled workers are rewarded with high pay, and the rest of workers are left behind. It will be important to creating nontraditional pathways for building skills. As AI begins to impact the workforce and automation replaces some existing skills, we are seeing an increased need for emotional intelligence, creativity, and critical thinking.

TVET in Bangladesh ought to play an important role in the 4IR to equip the youth of today for jobs in the future. The 4IR demands 21st century skills including critical thinking, creativity, adaptability, willingness to take risks, all attributes associated with entrepreneurship. The significance of entrepreneurship is the ability and determination to adopt challenges and devise solutions in an evolving environment. Developing entrepreneurship aptitudes in TVET offers a promising model for success in the 4IR. At the same time, potential threats to the labor market with the onset of the 4IR are giving rise to quality assurance among TVET institutions. SEIP of ADB is contributing to this effect.

Low-skilled and repetitive jobs are bound to be eliminated by robots and AI. This will force TVET institutions to partner and collaborate to ensure that TVET remains relevant in the future. TVET these days is drawing attention for its growing role in helping the workforce of the future. ILO’s recent Global Commission on the Future of Work (2019) study report assert a positive picture for the labor market that dispels the misnomer arising from the 4IR and the ‘fear’ of creating job loss in the market. The study projects that technological advances – AI, automation and robotics – will create new jobs, but those who lose their jobs in this transition may be the least equipped to seize the new opportunities. Today’s skills will not match the jobs of tomorrow and newly acquired skills may quickly become obsolete. Our systems of learning must change to meet the needs of a future workforce whose technical skill sets are constantly in flux and where employers are expecting graduates to have the soft skills to adapt. The greening of our economies, however, will create millions of jobs as we adopt sustainable practices and clean technologies, but other jobs will disappear as countries scale back their carbon- and resource-intensive industries. In the light of the forgoing analysis, specific policy interventions recommended include:

- (i) Activate and update NSDP-2020 to reflect new challenges and opportunities of the TVET and skills sub-sector;
- (ii) Complete the rolling out of the NTVQF and NSQF;
- (iii) Operationalize the NTVQF and NSQF through government orders and through appropriate communication strategy;
- (iv) Address the issues related to NTVQF certification (e.g. RPL) among the BTEB Act, NSDA Act and the NFE Act;
- (v) Provide appropriate level of resources (including human resources) to the public TVET providers motivating and empowering them to conduct local resource mapping, making localized/contextualized decisions including implementation of PPP in TVET;
- (vi) Assign a single competent agency to lead on the management of the LMI System (both supply and demand) to be supported by other relevant agencies; and
- (vii) Adapt TVET training to integrate all the skills mentioned in the skills portfolio and focus training on the top-ten skills noted in the text to prepare students with the best education for the job market in the future. The concept of lifelong learning, along with soft skills development, must be at the crux of the paradigm shift in the age of the 4IR.

Bangladesh industry is gradually embracing the latest technologies though cost imperatives make labor-intensive production still attractive. It will take several more years for technological change to catch up through leapfrogging innovations that are technology-intensive. These changes, automation, have to be closely watched due to the risk of machine-driven labor displacement, which might undermine labor-cost advantages on which Bangladesh has been relying so heavily. Having driven by growth with labor advantage over the last two decades, it is now time for Bangladesh to ride over the technology, innovation and digital opportunities to attain higher growth acceleration to reach upper-middle-income status by 2031 and to reach the advanced economy status by 2041.

Leveraging the Fourth Industrial Revolution: For strengthening competitiveness and creating high-income future work opportunities will lead to the prosperity of Bangladesh. Constantly jobs are being eaten up by advanced automation, and according to demonstrated technology potentials, most of the manual jobs in the RMG sector are vulnerable to automation. To counter this trend the government, leading companies, civil society, youths, entrepreneurs, politicians, start-ups and experts from all across the society will have to co-design and pilot innovative new approaches to policy and governance to counter negative implications and leverage 4IR. By 2041, Bangladesh will set targets such that the benefits from the 4IR are 50 percent more than the likely loss. The focus should be on integrating big data, data analytics, AI, and automation in creating more jobs than likely to be lost on the factory floor. In reality, the entire education ecosystem may have to be redesigned to address the dynamically changing issue.

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Annex-1: List of TVET Stakeholders and Key Informants

S.N.	Name	Designation	Address	Contact No.
1	Dr. Md. Morad Hossain Mollah	Chairman	Bangladesh Technical Education Board (BTEB), Begum Rokeya Sarani, Agargaon, Dhaka-1207	02-55006521 Email: chairman@bteb.gov.bd
2	Dr. Md. Nurul Islam	Director (Curriculum)	BTEB	02-55006523 Cell: 01715133710 nislampd@gmail.com
3	Krishibid Md. Mostofa Kamal	Curriculum Specialist (Agri)	BTEB	02-55006541 Cell: 01716796432 bteb.agri@gmail.com
4	Mohammad Abdul Quayum	Curriculum Specialist (Textile)	BTEB	Cell: 01716192778
5	Md. Anwar Hossain Mridha	Curriculum Specialist (BM)	BTEB	Cell: 01716453083 anwarmridha1968@gmail.com
6	Md. Abdus Salim	Curriculum Specialist (SSC-Voc)	BTEB	02-55006538 Cell: 01716715300 abdussalim63@gmail.com
7	Rupok Kanti Biswas	Quality Assurance Officer	BTEB	Cell: 01819179237 Email: b.rupakcpi@gmail.com
8	Engr. Md. Faruk Reza	Curriculum Specialist (Diploma) [C.C.]	BTEB	02-55006540 Cell: 01712255746 rezabteb@gmail.com
9	Mohammad Golam Mahiuddin Bhuiyan	Curriculum Specialist (Medical) [C.C.]	BTEB	Cell: 01716943064 mahib29@gmail.com
10	Md. Nowshad Ali	Curriculum Specialist (Dakhil Voc) [C.C.]	BTEB	Cell: 01716044611 nowsad77@gmail.com
11	Md. Moynul Hossain	Quality Assurance Officer	BTEB	Cell: 01718556612 moynulhossain2@gmail.com
12	Mr. Kamran T. Rahman	President	Bangladesh Employers Federations (BEF), Chamber Building, 122-124, Motijheel, Dhaka-1000	Tel: 880-2-9565208-10 Email: sg@mccibd.org
13	Mr. Farooq Ahmed	Secretary-General	Ditto	Tel: +880 2 956 5208 – 10 Email: sg@mccibd.org
14	Mr. Salahuddin Kasem Khan,	Managing Director	A. K. Khan & Co. Ltd.	Tel: 880-2-8818142-45
15	Md Anwar Hossain	Chairperson	National Coordination Committee for Workers Education (NCCWE)	Mobile: 01812230813 Email: anwarbjsd@gmail.com
16	Dr Wazedul Islam Khan	Member Secretary	NCCWE	Mobile: 01711240030 Email: drwajedgsbtuc@yahoo.com

S.N.	Name	Designation	Address	Contact No.
17	ILO		Block-F, Plot-17/B&C, Agargaon Administrative Zone, Sher-e-Bangla Nagar Dhaka-1207	IP Phone +880 9678777457 Tel: 880-2-55045009
18	Md. Sanowar Hossain	Director General	Directorate of Technical Education, F-4 / B, Sher-E-Bangla Nagar Administrative Area, Agargaon, Dhaka- 1207	Tel: 9110664 Email: techedu09@gmail.com
19	Md Faruque Hossain	Executive Chairman	National Skills Development Authority, 423-428 Tejgaon I/A, Dhaka-1208	Tel: 8891091 Email: ec@nsda.gov.bd
20	Mohammad Rezaul Karim	Member (Skills Standard & Certification)	NSDA	Tel:8891096
21	Md. Rezaul Haque	Additional Secretary (Labour Wing)	Ministry of Labour and Employment	Tel: 9515355 Cell: 01712550038 Email: addseclabour@mole.gov.bd
22	Md. Nazibul Islam	Additional Secretary (Training Wing)	Ministry of Expatriates' Welfare and Overseas Employment, Eskaton Garden, Probashi Kalyan Bhaban, 5th Floor, 71 & 72 Old Elephant Road, Dhaka-1000	Tel: 41030235 Cell: 01717525449 Email: jstraining@probashi.gov.bd
23	Md. Sazzad Hossain	Director (Training Standards & Planning)	BMET	Tel: 8313777 Cell: 01715158153 Email: sazzadbmet@gmail.com
24	A. K. M. Mizanur Rahman	Director- General	Department of Labour	Tel: 8391466 Cell: 01819558065 Email: dg@dol.gov.bd
25	Md. Iqbal Hossain	Director	Skills and Training Innovation Institute of UCEP Bangladesh, 2 & 3 Mirpur-2, Dhaka-1216	Tel: 9011749 Phone : 9031014, 9031016, 9011726 Email : info@ucepbd.org
26	Engr. Ahab Siddique	Manager (Training & Education)	MAWTS Institute of Technology, 1/C-1/A, Pallabi, Mirpur-12, Dhaka- 1216	Tel: 9002544 Cell: 01721275717 Email: tmmawts@caritasmc.org

Annex-2: BIDS Field Survey of TVET (January-February 2021) Results

1. TVET Institutions

Type of funding of the institution	Type of management authority of the institution					
	Public		NGO		Private	
	Number	%	Number	%	Number	%
Fully privately-financed	0	0	1	10	82	60.74
Fully donor supported	0	0	2	20	10	7.41
Partly donor supported	0	0	5	50	16	11.85
Partly government supported	0	0	0	0	23	17.04
Others	0	0	2	20	4	2.96
Total	0	0	10	100	135	100

Table-1 Is the Institution registered by BTEB?

Type of Institute	yes		no	
	N	%	N	%
Govt.	25	16.13	130	83.87
NGO	9	5.81	146	94.19
Private	121	78.06	34	21.94
Total	155	33.33	310	66.67

Infrastructure

TVET Institutions by Ownership	Average amount of land available for the institution (in decimal)		Existing campus of the institution having ready land for developing new buildings				Number of building/structure the institutions have	
	Total	Average	Yes cases		No. cases		Total	Average
			No.	%	No.	%		
Public	13153.5	526.14	22	88.0	3	12.0	151	6.29
NGO	1002.32	111.37	8	88.9	1	11.1	29	3.22
Private	15309.88	126.53	82	67.8	39	32.2	295	2.52
Total	29465.7	190.10	112	72.3	43	27.7	475	3.17

Rooms of TVET institutions by type & by type of institutions

Type of rooms	Public		NGO		Private		Total	
	Number	%	Number	%	Number	%	Number	%
Administrative	162	15.14	45	12.15	412	18.65	619	17.71
Class rooms	467	47.85	176	40.49	1620	52.45	2263	51.01
Lab rooms	257	24.25	131	30.45	615	23.63	1003	24.13
Residential	488	12.77	301	16.91	760	5.27	1549	7.15

Type of rooms	Public		NGO		Private		Total	
Total	1374	100.0	653	100.0	3407	100.0	5434	100.0
Average per institution	54.96		72.55		28.16		35.06	

Distribution of TVET institutions by material of the walls, roofs and floors of the buildings/structures

Material of the of the buildings/structures	Wall			Roof			Floor		
	Public	NGO	Private	Public	NGO	Private	Public	NGO	Private
Brick and cement	100	88.89	94.21	92	77.78	77.69	100	88.89	90.08
Tin	0	11.11	5.79	8	22.22	22.31	0	0	1.65
Bamboo	0	0	0	0	0	0	0	11.11	5.79
Tiles	0	0	0	0	0	0	0	0	2.48
Soil	0	0	0	0	0	0	0	0	0
Straw/ Chhan	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100

Distribution of TVET institutions by condition of class rooms & labs rooms

Condition of class rooms & labs rooms on average	Condition of the class rooms			Condition of the lab rooms		
	Public	NGO	Private	Public	NGO	Private
Good	48.00	88.89	57.02	48.00	77.78	52.89
Workable but repair needed	40.00	11.11	33.06	44.00	22.22	33.88
Repair needed	12.00	0.00	9.09	8.00	0.00	11.57
Bad	0.00	0.00	0.83	0.00	0.00	1.65
Total	100.00	100.00	100.00	100.00	100.00	100.00

Distribution of TVET institutions by adequacy of the number of equipment in the lab rooms

Type of TVET Institutions	Adequate	Inadequate	Total
Public	44.00	56.00	100
NGO	88.89	11.11	100
Private	40.50	59.50	100
Total	43.87	56.13	100

Distribution of TVET institutions by adequacy of the number & dating of major equipment

Table-1.7a: Percentage distribution of TVET institutions by adequacy of the number & dating of major equipment in the lab rooms

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
Govt.	CNC milling machine	1	11.1%	0	0.0%	0	0.0%	0	0.0%	1	5.9%
	Computer	3	33.3%	5	31.3%	0	0.0%	0	0.0%	8	47.1%
	Led machine	1	11.1%	1	6.3%	0	0.0%	1	16.7%	1	5.9%
	Other	1	11.1%	1	6.3%	0	0.0%	1	16.7%	1	5.9%
	Milling machine	0	0.0%	1	6.3%	0	0.0%	1	16.7%	0	0.0%
	Laptop, printer & scanner projector	0	0.0%	1	6.3%	0	0.0%	0	0.0%	1	5.9%
	Escru driver Haturi, spray machine etc	0	0.0%	1	6.3%	0	0.0%	1	16.7%	0	0.0%
	Projector	0	0.0%	2	12.5%	0	0.0%	0	0.0%	2	11.8%
	Abo meter	0	0.0%	1	6.3%	0	0.0%	1	16.7%	0	0.0%
	Transformer	1	11.1%	0	0.0%	0	0.0%	0	0.0%	1	5.9%
	Adjustable range file flot	0	0.0%	1	6.3%	0	0.0%	0	0.0%	1	5.9%
	Rod binding handle	1	11.1%	0	0.0%	1	50.0	0	0.0%	0	0.0%
	U T S machine	1	11.1%	0	0.0%	1	50.0	0	0.0%	0	0.0%
	Laptop	0	0.0%	1	6.3%	0	0.0%	0	0.0%	1	5.9%
Presser cooker	0	0.0%	1	6.3%	0	0.0%	1	16.7%	0	0.0%	
Total	9	36.0%	16	64.0%	2	8%	6	24%	17	68%	
NGO	Mobile operated sewing machine	1	14.3%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
	Computer	1	14.3%	1	50.0%	0	0.0%	0	0.0%	2	28.6%
	Civic rod pasting machine	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
	Other	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
	Escru driver Haturi, spray machine etc	1	14.3%	1	50.0%	0	0.0%	0	0.0%	2	28.6%
	Volt meter	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
	White board	1	14.3%	0	0.0%	1	50.0	0	0.0%	0	0.0%
	Total	7	77.8%	2	22.2%	2		0		7	77.8%
Private	Mobile operated sewing machine	2	4.5%	0	0.0%	1	3.7%	0	0.0%	1	1.7%
	Cutting table and peter making tools	0	0.0%	1	1.3%	0	0.0%	0	0.0%	1	1.7%
	CNC milling machine	0	0.0%	1	1.3%	0	0.0%	0	0.0%	1	1.7%
	Embroidery machine(tools)	0	0.0%	1	1.3%	0	0.0%	1	2.9%	0	0.0%
	Computer	19	43.2%	34	44.2%	10	37.0	11	31.4%	32	54.2%
	Lathe machine	0	0.0%	4	5.2%	1	3.7%	2	5.7%	1	1.7%
	Total station	1	2.3%	0	0.0%	1	3.7%	0	0.0%	0	0.0%
	Welding machine shop	1	2.3%	2	2.6%	0	0.0%	1	2.9%	2	3.4%
	Oscilloscope	0	0.0%	1	1.3%	0	0.0%	1	2.9%	0	0.0%
	Electrical machine	1	2.3%	1	1.3%	2	7.4%	0	0.0%	0	0.0%
	Milling machine	1	2.3%	0	0.0%	0	0.0%	0	0.0%	1	1.7%
	Microscope Anubikhan jantra	0	0.0%	1	1.3%	0	0.0%	0	0.0%	1	1.7%
	Photo test machine	0	0.0%	3	3.9%	1	3.7%	0	0.0%	2	3.4%
	Bio-chemist machine	1	2.3%	0	0.0%	0	0.0%	1	2.9%	0	0.0%
	Analyzer machine	0	0.0%	1	1.3%	0	0.0%	0	0.0%	1	1.7%
	Dental care machine	1	2.3%	1	1.3%	1	3.7%	0	0.0%	1	1.7%
	Projector	0	0.0%	1	1.3%	0	0.0%	1	2.9%	0	0.0%
	Level machine	0	0.0%	1	1.3%	0	0.0%	0	0.0%	1	1.7%
	Volt meter	2	4.5%	2	2.6%	1	3.7%	1	2.9%	2	3.4%
	Abo meter	2	4.5%	2	2.6%	2	7.4%	2	5.7%	0	0.0%

Table-1.7a: Percentage distribution of TVET institutions by adequacy of the number & dating of major equipment in the lab rooms

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
	Circuit board	2	4.5%	2	2.6%	0	0.0%	3	8.6%	1	1.7%
	Heat panel board	0	0.0%	1	1.3%	1	3.7%	0	0.0%	0	0.0%
	Sewing machine	0	0.0%	3	3.9%	0	0.0%	1	2.9%	2	3.4%
	P.C	0	0.0%	3	3.9%	0	0.0%	1	2.9%	2	3.4%
	White board	1	2.3%	1	1.3%	1	3.7%	0	0.0%	1	1.7%
	Drill machine	0	0.0%	4	5.2%	0	0.0%	3	8.6%	1	1.7%
	Sewing Bartech machine	2	4.5%	1	1.3%	1	3.7%	2	5.7%	0	0.0%
	Scanner machine	1	2.3%	0	0.0%	1	3.7%	0	0.0%	0	0.0%
	Laptop	2	4.5%	0	0.0%	2	7.4%	0	0.0%	0	0.0%
	Net work Hul	1	2.3%	0	0.0%	0	0.0%	0	0.0%	1	1.7%
	Car	0	0.0%	1	1.3%	0	0.0%	0	0.0%	1	1.7%
	Car	1	2.3%	0	0.0%	0	0.0%	0	0.0%	1	1.7%
	Amplifyre	0	0.0%	1	1.3%	0	0.0%	1	2.9%	0	0.0%
	Refrigerator	1	2.3%	1	1.3%	0	0.0%	1	2.9%	1	1.7%
	Dry machine	0	0.0%	1	1.3%	0	0.0%	1	2.9%	0	0.0%
	Shallow machine	0	0.0%	1	1.3%	0	0.0%	1	2.9%	0	0.0%
	Motor	1	2.3%	0	0.0%	0	0.0%	0	0.0%	1	1.7%
	Altera sound machine	1	2.3%	0	0.0%	1	3.7%	0	0.0%	0	0.0%
	Total	44	36.4%	77	63.6%	27	22.3	35	28.9%	59	48.8%

Distribution of TVET institutions by adequacy of the number & dating of major equipment

Table-1.7b: % distribution of TVET institutions by adequacy of the number & dating of major equipment in the lab rooms

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
Govt.	CNC milling machine	0	0.0%	1	6.3%	1	33.3%	0	0.0%	0	0.0%
	Abrasion testing machine	1	11.1%	0	0.0%	1	33.3%	0	0.0%	0	0.0%
	Computer	1	11.1%	1	6.3%	1	33.3%	0	0.0%	1	7.1%
	Hydraulic machine	1	11.1%	0	0.0%	0	0.0%	0	0.0%	1	7.1%
	Civic rod pasting machine	1	11.1%	0	0.0%	0	0.0%	0	0.0%	1	7.1%
	Other	0	0.0%	1	6.3%	0	0.0%	1	12.5%	0	0.0%
	Welding machine shop	1	11.1%	0	0.0%	0	0.0%	0	0.0%	1	7.1%
	Shaper machine	1	11.1%	1	6.3%	0	0.0%	1	12.5%	1	7.1%
	AVO miter	0	0.0%	1	6.3%	0	0.0%	1	12.5%	0	0.0%
	Laptop, printer & scanner projector	1	11.1%	0	0.0%	0	0.0%	0	0.0%	1	7.1%
	Vacuum cleaner/Refrigerator	0	0.0%	1	6.3%	0	0.0%	0	0.0%	1	7.1%
	Projector	0	0.0%	2	12.5%	0	0.0%	0	0.0%	2	14.3%
	Volt meter	0	0.0%	1	6.3%	0	0.0%	1	12.5%	0	0.0%
	Abo meter	1	11.1%	0	0.0%	0	0.0%	0	0.0%	1	7.1%
	Transformer	0	0.0%	1	6.3%	0	0.0%	1	12.5%	0	0.0%
	Sewing machine	0	0.0%	2	12.5%	0	0.0%	1	12.5%	1	7.1%
	White board	0	0.0%	1	6.3%	0	0.0%	0	0.0%	1	7.1%
	Drill machine	0	0.0%	1	6.3%	0	0.0%	1	12.5%	0	0.0%

Table-1.7b: % distribution of TVET institutions by adequacy of the number & dating of major equipment in the lab rooms											
Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
Total NGO	Adjustable range file float	0	0.0%	1	6.3%	0	0.0%	1	12.5%	0	0.0%
	Laptop	1	11.1%	0	0.0%	0	0.0%	0	0.0%	1	7.1%
	Printer	0	0.0%	1	6.3%	0	0.0%	0	0.0%	1	7.1%
	Total	9	36%	16	64%	3	12%	8	32%	14	56%
	CNC milling machine	1	14.3%	0	0.0%	1	25.0%	0	0.0%	0	0.0%
	Computer	2	28.6%	0	0.0%	2	50.0%	0	0.0%	0	0.0%
	Other	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	25.0%
	Electrical machine	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	25.0%
	Shaper machine	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	25.0%
Total Private	Laptop, printer & scanner projector	0	0.0%	2	100.0%	0	0.0%	1	100.0%	1	25.0%
	Refrigerator	1	14.3%	0	0.0%	1	25.0%	0	0.0%	0	0.0%
	Total	7	77.8%	2	22.2%	4	44.4%	1	11.1%	4	44.4%
	Mobile operated sewing machine	1	2.1%	1	1.4%	0	0.0%	0	0.0%	2	3.4%
	Cutting table and peter making tools	1	2.1%	0	0.0%	1	3.4%	0	0.0%	0	0.0%
	Core winding machine	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%
	Embroidery machine(tools)	1	2.1%	0	0.0%	0	0.0%	0	0.0%	1	1.7%
	Computer	6	12.8%	2	2.8%	5	17.2%	2	6.5%	1	1.7%
	Lathe machine	3	6.4%	2	2.8%	2	6.9%	1	3.2%	2	3.4%
	Other	1	2.1%	0	0.0%	1	3.4%	0	0.0%	0	0.0%
	Welding machine shop	0	0.0%	4	5.6%	0	0.0%	2	6.5%	2	3.4%
	Oscilloscope	1	2.1%	1	1.4%	1	3.4%	1	3.2%	0	0.0%
	Shattered machine	0	0.0%	1	1.4%	1	3.4%	0	0.0%	0	0.0%
	Machine tools	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%
	Electrical machine	0	0.0%	2	2.8%	0	0.0%	1	3.2%	1	1.7%
	Shaper machine	0	0.0%	1	1.4%	0	0.0%	1	3.2%	0	0.0%
	AVO miter	0	0.0%	1	1.4%	0	0.0%	1	3.2%	0	0.0%
	Microscope	2	4.3%	1	1.4%	2	6.9%	0	0.0%	1	1.7%
	Anubikhan jantra										
	Analyzer skeleton	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%
	Computer										
Laptop, printer & scanner projector	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%	
Photo test machine	1	2.1%	0	0.0%	1	3.4%	0	0.0%	0	0.0%	
Lazier	1	2.1%	0	0.0%	1	3.4%	0	0.0%	0	0.0%	
Century fuze machine	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%	
ECR machine	1	2.1%	0	0.0%	0	0.0%	0	0.0%	1	1.7%	
Projector	3	6.4%	6	8.3%	1	3.4%	1	3.2%	7	11.9%	
Skill development & safety book	1	2.1%	0	0.0%	0	0.0%	0	0.0%	1	1.7%	
Volt meter	1	2.1%	3	4.2%	0	0.0%	3	9.7%	1	1.7%	
Multi media	3	6.4%	0	0.0%	2	6.9%	1	3.2%	0	0.0%	
AVO meter	0	0.0%	2	2.8%	1	3.4%	1	3.2%	0	0.0%	
Transformer	1	2.1%	1	1.4%	0	0.0%	1	3.2%	1	1.7%	
Circuit board	0	0.0%	1	1.4%	0	0.0%	1	3.2%	0	0.0%	
LT panel board	0	0.0%	1	1.4%	0	0.0%	1	3.2%	0	0.0%	
Sewing machine	1	2.1%	5	6.9%	2	6.9%	3	9.7%	1	1.7%	

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
	White board	0	0.0%	4	5.6%	0	0.0%	2	6.5%	2	3.4%
	Key board, mouse & monitor	1	2.1%	2	2.8%	0	0.0%	0	0.0%	3	5.1%
	Drill machine	0	0.0%	4	5.6%	1	3.4%	1	3.2%	2	3.4%
	Adjustable range file float	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%
	Rod binding handle	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%
	Printer scanner	6	12.8%	2	2.8%	4	13.8%	1	3.2%	3	5.1%
	Kansai machine	1	2.1%	0	0.0%	0	0.0%	0	0.0%	1	1.7%
	Scanner machine	3	6.4%	0	0.0%	0	0.0%	0	0.0%	3	5.1%
	Television	1	2.1%	1	1.4%	0	0.0%	0	0.0%	2	3.4%
	Desk	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%
	Laptop	0	0.0%	3	4.2%	0	0.0%	1	3.2%	2	3.4%
	Furniture	0	0.0%	2	2.8%	0	0.0%	0	0.0%	2	3.4%
	Surveyor machine	1	2.1%	0	0.0%	0	0.0%	0	0.0%	1	1.7%
	Multimedia	1	2.1%	1	1.4%	1	3.4%	1	3.2%	0	0.0%
	Power loom	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%
	AC	0	0.0%	1	1.4%	0	0.0%	0	0.0%	1	1.7%
	Refrigerator	1	2.1%	1	1.4%	0	0.0%	0	0.0%	2	3.4%
	Micro oven	1	2.1%	0	0.0%	0	0.0%	0	0.0%	1	1.7%
	Sewing machine	1	2.1%	1	1.4%	0	0.0%	1	3.2%	1	1.7%
	Generator	1	2.1%	0	0.0%	0	0.0%	1	3.2%	0	0.0%
	Dry machine	0	0.0%	1	1.4%	0	0.0%	1	3.2%	0	0.0%
	Motor	0	0.0%	2	2.8%	0	0.0%	1	3.2%	1	1.7%
	Presser cooker	0	0.0%	2	2.8%	1	3.4%	0	0.0%	1	1.7%
	Button hole machine	0	0.0%	1	1.4%	1	3.4%	0	0.0%	0	0.0%
Total	Total	47	39.5%	72	60.5%	29	24.4%	31	26.0%	59	49.6%

Distribution of TVET institutions by adequacy of the number & dating of major equipment in the lab rooms

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
Govt.	Computer	2	33.3%	2	11.8%	0	0.0%	2	20.0%	2	16.7%
	Led machine	1	16.7%	1	5.9%	0	0.0%	1	10.0%	1	8.3%
	Other	0	0.0%	1	5.9%	0	0.0%	0	0.0%	1	8.3%
	Machine tools	0	0.0%	2	11.8%	0	0.0%	1	10.0%	1	8.3%
	Electrical machine	0	0.0%	1	5.9%	0	0.0%	1	10.0%	0	0.0%
	Shaper machine	1	16.7%	0	0.0%	0	0.0%	1	10.0%	0	0.0%
	Vacuum cleaner/Refrigerator	0	0.0%	1	5.9%	0	0.0%	1	10.0%	0	0.0%
	Variable AC power supply	0	0.0%	1	5.9%	0	0.0%	0	0.0%	1	8.3%
	Projector	0	0.0%	1	5.9%	0	0.0%	0	0.0%	1	8.3%
	Sewing machine	0	0.0%	1	5.9%	0	0.0%	0	0.0%	1	8.3%
	White board	1	16.7%	0	0.0%	0	0.0%	0	0.0%	1	8.3%
	Scale/Campus/set square	0	0.0%	1	5.9%	0	0.0%	1	10.0%	0	0.0%
	AC	1	16.7%	0	0.0%	0	0.0%	0	0.0%	1	8.3%
	Gas cylinder	0	0.0%	1	5.9%	0	0.0%	0	0.0%	1	8.3%
	Rice cooker	0	0.0%	1	5.9%	0	0.0%	0	0.0%	1	8.3%
	Generator	0	0.0%	1	5.9%	0	0.0%	1	10.0%	0	0.0%

Table-1.7c: % distribution of TVET institutions by adequacy of the number & dating of major equipment in the lab rooms											
Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
Total NGO	Motor	0	0.0%	1	5.9%	0	0.0%	1	10.0%	0	0.0%
	Total	6	27.3%	16	72.7%	0	0.0%	10	45.5%	12	54.5%
	Computer	1	14.3%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
	Other	1	14.3%	1	100.0%	0	0.0%	0	0.0%	2	40.0%
	Electrical machine	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	20.0%
	AVO miter	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	20.0%
	Level machine	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	20.0%
	Sewing machine	1	14.3%	0	0.0%	0	0.0%	1	50.0%	0	0.0%
	AC	1	14.3%	0	0.0%	0	0.0%	1	50.0%	0	0.0%
	Cutting table and peter making tools	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
Total Private	Total	7	77.8%	2	22.2%	1	11.1%	2	22.2%	6	66.7%
	Hand loom	1	2.2%	0	0.0%	1	3.3%	0	0.0%	0	0.0%
	Abrasion testing machine	1	2.2%	0	0.0%	1	3.3%	0	0.0%	0	0.0%
	Computer	2	4.4%	4	6.2%	0	0.0%	1	3.1%	5	10.0%
	Lathe machine	1	2.2%	1	1.5%	1	3.3%	1	3.1%	0	0.0%
	Total station	0	0.0%	1	1.5%	1	3.3%	0	0.0%	0	0.0%
	Other	3	6.7%	3	4.6%	2	6.7%	2	6.3%	2	4.0%
	Machine tools	0	0.0%	1	1.5%	1	3.3%	0	0.0%	0	0.0%
	Shaper machine	1	2.2%	1	1.5%	0	0.0%	1	3.1%	1	2.0%
	AVO miter	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Microscope	2	4.4%	1	1.5%	3	10.0%	0	0.0%	0	0.0%
	Anubikhan jantra										
	Laptop, printer & scanner projector	2	4.4%	2	3.1%	1	3.3%	1	3.1%	2	4.0%
	Photo test machine	1	2.2%	0	0.0%	1	3.3%	0	0.0%	0	0.0%
	Screw driver hammer, spray machine etc	1	2.2%	0	0.0%	0	0.0%	0	0.0%	1	2.0%
	Vacuum cleaner/Refrigerator	1	2.2%	0	0.0%	1	3.3%	0	0.0%	0	0.0%
	Variable AC power supply	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Projector	3	6.7%	6	9.2%	2	6.7%	3	9.4%	4	8.0%
	DNC set/Viscera/Model chart	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Repair waving machine	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Level machine	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Volt meter	3	6.7%	2	3.1%	3	10.0%	1	3.1%	2	4.0%
	Multi media	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Abo meter	2	4.4%	1	1.5%	0	0.0%	3	9.4%	0	0.0%
	Transformer	0	0.0%	2	3.1%	0	0.0%	1	3.1%	1	2.0%
	Circuit board	1	2.2%	0	0.0%	1	3.3%	0	0.0%	0	0.0%
	Heat panel board	1	2.2%	0	0.0%	0	0.0%	1	3.1%	0	0.0%
	Sewing machine	1	2.2%	1	1.5%	0	0.0%	2	6.3%	0	0.0%
	White board	1	2.2%	3	4.6%	1	3.3%	1	3.1%	2	4.0%
	Key board, mouse & monitor	0	0.0%	2	3.1%	0	0.0%	0	0.0%	2	4.0%
Drill machine	0	0.0%	1	1.5%	0	0.0%	1	3.1%	0	0.0%	
Adjustable range file float	0	0.0%	1	1.5%	0	0.0%	1	3.1%	0	0.0%	
Rod binding handle	2	4.4%	1	1.5%	1	3.3%	0	0.0%	2	4.0%	

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
	Printer scanner	3	6.7%	2	3.1%	1	3.3%	1	3.1%	3	6.0%
	Sewing button machine	2	4.4%	0	0.0%	2	6.7%	0	0.0%	0	0.0%
	Food of the arm machine	1	2.2%	1	1.5%	0	0.0%	1	3.1%	1	2.0%
	Scanner machine	1	2.2%	2	3.1%	1	3.3%	0	0.0%	2	4.0%
	Television	1	2.2%	0	0.0%	1	3.3%	0	0.0%	0	0.0%
	Laptop	2	4.4%	3	4.6%	0	0.0%	4	12.5%	1	2.0%
	Surveyor machine	1	2.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Dipotial	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Multimedia	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	DSLR	0	0.0%	1	1.5%	0	0.0%	1	3.1%	0	0.0%
	Energy meter/Micheleâ€™s watt miter	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Gas slender	0	0.0%	1	1.5%	0	0.0%	1	3.1%	0	0.0%
	Refrigerator	0	0.0%	2	3.1%	0	0.0%	0	0.0%	3	6.0%
	Various knives	1	2.2%	0	0.0%	0	0.0%	0	0.0%	1	2.0%
	Rice cocker	0	0.0%	4	6.2%	2	6.7%	1	3.1%	1	2.0%
	Building maintenance tools	1	2.2%	0	0.0%	0	0.0%	0	0.0%	1	2.0%
	TV	0	0.0%	1	1.5%	0	0.0%	1	3.1%	0	0.0%
	Generator	0	0.0%	1	1.5%	0	0.0%	1	3.1%	0	0.0%
	Gear box	1	2.2%	0	0.0%	0	0.0%	0	0.0%	1	2.0%
	Printer	0	0.0%	1	1.5%	0	0.0%	1	3.1%	0	0.0%
	Presser cooker	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Engine box	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	2.0%
	Hot air oven	1	2.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	Total	45	41.3%	64	58.7%	28	25.7%	32	29.4%	49	44.9%

Distribution of TVET institutions by adequacy of the number & dating of major equipment

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
Govt.	Mobile operated sewing machine	0	0.0%	1	7.1%	0	0.0%	0	0.0%	1	14.3
	CNC milling machine	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	14.3
	Computer	0	0.0%	2	14.3%	0	0.0%	2	18.2%	0	0.0
	Lathe machine	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	14.3
	Other	1	14.3%	1	7.1%	1	33.3%	1	9.1%	0	0.0
	Welding machine shop	1	14.3%	1	7.1%	0	0.0%	0	0.0%	2	28.6
	Oscilloscope	0	0.0%	1	7.1%	0	0.0%	1	9.1%	0	0.0
	Switch opener tool box	0	0.0%	1	7.1%	0	0.0%	0	0.0%	1	14.3
	Projector	1	14.3%	0	0.0%	0	0.0%	1	9.1%	0	0.0
	Volt meter	0	0.0%	1	7.1%	1	33.3%	0	0.0%	0	0.0
	Transformer	0	0.0%	1	7.1%	0	0.0%	1	9.1%	0	0.0
	Sewing machine	0	0.0%	1	7.1%	0	0.0%	1	9.1%	0	0.0
	Drill machine	0	0.0%	2	14.3%	0	0.0%	1	9.1%	1	14.3
	Various operators	0	0.0%	1	7.1%	0	0.0%	1	9.1%	0	0.0

Table-1.7d: % distribution of TVET institutions by adequacy of the number & dating of major equipment in the lab rooms

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
Total NGO	Scale/Campus/set squire	1	14.3%	0	0.0%	1	33.3%	0	0.0%	0	0.0
	Energy meter/Micheleâ€™s watt miter	0	0.0%	1	7.1%	0	0.0%	1	9.1%	0	0.0
	Fan motor cable	1	14.3%	0	0.0%	0	0.0%	1	9.1%	0	0.0
	Total	7	33.3%	14	66.7%	3	14.3%	11	52.4%	7	33.3
	Mobile operated sewing machine	1	20.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3
	Computer	1	20.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3
	Lathe machine	1	20.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3
Total Private	Other	1	20.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0
	Welding machine shop	1	20.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0
	Total	5	100%	0	0.0%	0	0.0%	2	40%	3	60
	Mobile operated sewing machine	1	2.4%	0	0.0%	0	0.0%	0	0.0%	1	2.7
	Core winding machine	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0
	Universal testing machine	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0
	Computer	2	4.9%	11	20.4%	2	8.0%	4	12.1%	7	18.9
	Lathe machine	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0
	Total station	1	2.4%	0	0.0%	0	0.0%	0	0.0%	1	2.7
	Hydrolic machine	0	0.0%	1	1.9%	1	4.0%	0	0.0%	0	0.0
	Other	3	7.3%	4	7.4%	2	8.0%	5	15.2%	0	0.0
	Welding machine shop	1	2.4%	1	1.9%	1	4.0%	1	3.0%	0	0.0
	Switch gear protection	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0
	Electrical machine	1	2.4%	2	3.7%	1	4.0%	1	3.0%	1	2.7
	Shaper machine	1	2.4%	0	0.0%	0	0.0%	0	0.0%	1	2.7
	Photo test machine	1	2.4%	1	1.9%	1	4.0%	0	0.0%	1	2.7
	Lazier	1	2.4%	1	1.9%	0	0.0%	1	3.0%	1	2.7
	Projector	5	12.2%	2	3.7%	1	4.0%	0	0.0%	6	16.2
	Lock stitch machine	0	0.0%	1	1.9%	0	0.0%	0	0.0%	1	2.7
	Volt meter	2	4.9%	3	5.6%	1	4.0%	2	6.1%	2	5.4
	Multi media	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0
	Abo meter	2	4.9%	1	1.9%	2	8.0%	1	3.0%	0	0.0
	Circuit board	0	0.0%	1	1.9%	0	0.0%	0	0.0%	1	2.7
LT panel board	1	2.4%	0	0.0%	0	0.0%	1	3.0%	0	0.0	
Sewing machine	1	2.4%	1	1.9%	0	0.0%	2	6.1%	0	0.0	
White board	1	2.4%	6	11.1%	0	0.0%	1	3.0%	6	16.2	
Key board, mouse & monitor	1	2.4%	1	1.9%	1	4.0%	1	3.0%	0	0.0	
Adjustable range file float	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0	
Rod binding handle	0	0.0%	3	5.6%	0	0.0%	0	0.0%	3	8.1	
Printer scanner	0	0.0%	2	3.7%	1	4.0%	0	0.0%	1	2.7	
Router server machine	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0	
Food of the arm machine	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0	
Scanner machine	0	0.0%	2	3.7%	0	0.0%	2	6.1%	0	0.0	
Books	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0	

Trades		Equipment Enough or not				Equipment lifetime					
		Enough		Not enough		Modern		Old		Neither modern nor old	
		Count	N %	Count	N %	Count	N %	Count	N %	Count	N %
	Board	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0
	Net work Hull	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0
	Scale/Campus/set squire	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0
	Refrigerator	3	7.3%	0	0.0%	1	4.0%	1	3.0%	1	2.7
	Various utensils	1	2.4%	0	0.0%	0	0.0%	0	0.0%	1	2.7
	Rice cocker	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0
	Thewday light	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0
	Generator	0	0.0%	1	1.9%	0	0.0%	1	3.0%	0	0.0
	Gear box	2	4.9%	0	0.0%	1	4.0%	0	0.0%	1	2.7
	Printer	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0
	Presser cooker	0	0.0%	1	1.9%	0	0.0%	0	0.0%	1	2.7
	Button hole machine	1	2.4%	0	0.0%	0	0.0%	1	3.0%	0	0.0
	Compressor	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0
	X-ray machine	1	2.4%	0	0.0%	1	4.0%	0	0.0%	0	0.0
Total	Total	41	43.2%	54	56.8%	25	26.4%	33	34.7%	37	38.9

Distribution of TVET institutions by ownership of the place of institution, residence facility for students & online teaching capacity

Type of TVET Institutions	Ownership of the place of institution		Residence facility for students		Online teaching capacity	
	Rented	Owned	Yes cases	No cases	Yes cases	No cases
Public	12.00	88.00	28.00	72.00	96.00	4.00
NGO	22.22	77.78	44.44	55.56	88.89	11.11
Private	35.54	64.46	16.53	83.47	83.47	16.53
Total	30.97	69.03	20.00	80.00	85.81	14.19

Future Needs of the TVET Institutions

Needs for teachers:	Within next 5 years			Within next 10 years		
	Govt.	NGO	Private	Govt.	NGO	Private
	N %	N %	N %	N %	N %	N %
Trade based skill training	44.0%	0.0%	17.4%	40.0%	0.0%	23.3%
Insurance policy	0.0%	0.0%	2.5%	0.0%	0.0%	3.3%
Make sure health & accommodation facility	24.0%	22.2%	24.0%	28.0%	33.3%	20.8%
Industry visit	0.0%	0.0%	3.3%	0.0%	0.0%	.8%
Refresher Training	0.0%	0.0%	.8%	0.0%	0.0%	.8%
Need training from abroad	16.0%	11.1%	14.9%	16.0%	11.1%	10.0%
Industry visit	0.0%	0.0%	0.0%	0.0%	0.0%	.8%
Increased salary & other allowances	4.0%	11.1%	9.1%	0.0%	11.1%	10.0%
Make sure Transport support	0.0%	0.0%	.8%	0.0%	0.0%	.8%
Teachers need to linkage with the Industries	8.0%	0.0%	3.3%	4.0%	0.0%	1.7%
Increased salary & other allowances	20.0%	44.4%	42.1%	24.0%	22.2%	37.5%
Give promotion regularly	8.0%	11.1%	1.7%	8.0%	22.2%	.8%
Need Modern lab	4.0%	0.0%	0.0%	4.0%	0.0%	1.7%

Table-1.9: Percentage distribution of TVET institutions by future needs within 5 years & within 10 years

Needs for teachers:	Within next 5 years			Within next 10 years		
	Govt.	NGO	Private	Govt.	NGO	Private
	N %	N %	N %	N %	N %	N %
All the necessary materials have to be given for training in lab	20.0%	22.2%	14.9%	20.0%	22.2%	13.3%
Sometimes Need Industry visit	0.0%	0.0%	.8%	0.0%	0.0%	.8%
The job must be recognized	0.0%	11.1%	13.2%	0.0%	11.1%	5.0%
Make inquter center for the teacher	0.0%	0.0%	.8%	0.0%	0.0%	1.7%
Make sure pension facility	0.0%	11.1%	0.0%	0.0%	11.1%	0.0%
Need Separates teachers' room	16.0%	0.0%	.8%	8.0%	0.0%	1.7%
Give aerometer to the teacher	0.0%	0.0%	.8%	0.0%	0.0%	.8%
Need Separate training room	0.0%	0.0%	1.7%	0.0%	0.0%	.8%
Needs for teacher training:	Within next 5 years			Within next 10 years		
	Govt	NGO	Privet	Govt	NGO	Privet
	N %	N %	N %	N %	N %	N %
Trade based all the necessary materials	44.0%	55.6%	40.5%	37.5%	66.7%	37.5%
Router, electrical training table	8.0%	11.1%	9.1%	8.3%	11.1%	8.3%
Expert trainer	16.0%	22.2%	27.3%	29.2%	22.2%	29.2%
Industrial linkage	0.0%	11.1%	0.0%	0.0%	11.1%	0.0%
TVET/NTVOF(Leve-3)	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%
Projector	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%
Master trainer	12.0%	11.1%	12.4%	12.5%	0.0%	12.5%
Free cost training	20.0%	0.0%	9.1%	29.2%	0.0%	29.2%
Expert trainer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Laptop/Computer	24.0%	44.4%	17.4%	12.5%	22.2%	12.5%
Separate hall room	4.0%	0.0%	9.1%	0.0%	11.1%	0.0%
Free cost training	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trade based all the necessary materials	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%
Trade based all the necessary materials	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%
Trade based all the necessary materials	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%
Modern Training equipment & lab	4.0%	0.0%	2.5%	4.2%	0.0%	4.2%
Inqubitor center	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
District based training	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%
Factory visit	0.0%	0.0%	.8%	0.0%	0.0%	0.0%
Online training	0.0%	0.0%	.8%	0.0%	0.0%	0.0%
Modern Training equipment & lab	0.0%	0.0%	2.5%	8.3%	0.0%	8.3%
Otherâ€™s	0.0%	0.0%	.8%	0.0%	0.0%	0.0%
Needs for training equipment:	Within next 5 years			Within next 10 years		
	Govt	NGO	Privet	Govt	NGO	Privet
	N %	N %	N %	N %	N %	N %
CNC Lethe machine	12.0%	22.2%	7.6%	12.0%	22.2%	8.5%
Carding machine for yarn lab	0.0%	11.1%	1.7%	0.0%	11.1%	.8%
Blow room for Yarn manufacture lab	0.0%	0.0%	0.0%	0.0%	0.0%	.8%
Software	0.0%	0.0%	0.0%	0.0%	11.1%	.8%
Projector	0.0%	0.0%	2.5%	0.0%	0.0%	2.5%
Laptop	4.0%	0.0%	.8%	4.0%	0.0%	1.7%
Fast aid bag for teacher	0.0%	0.0%	.8%	0.0%	0.0%	.8%
Modern equipment	32.0%	22.2%	31.4%	40.0%	22.2%	38.1%
Router	44.0%	33.3%	50.8%	40.0%	22.2%	42.4%
Digital white board	8.0%	0.0%	.8%	8.0%	0.0%	.8%
PLC	12.0%	22.2%	1.7%	12.0%	22.2%	.8%
Bio-metric Micro Controller	0.0%	0.0%	.8%	0.0%	0.0%	0.0%
Analyzer machine	0.0%	0.0%	.8%	0.0%	0.0%	.8%

Needs for teachers:	Within next 5 years			Within next 10 years		
	Govt.	NGO	Private	Govt.	NGO	Private
	N %	N %	N %	N %	N %	N %
Microscope machine	0.0%	0.0%	1.7%	0.0%	0.0%	1.7%
CNC Lethe machine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Shafer machine	0.0%	0.0%	3.4%	0.0%	0.0%	3.4%
Motor	0.0%	0.0%	5.9%	0.0%	0.0%	6.8%
Generator	0.0%	0.0%	7.6%	0.0%	0.0%	8.5%
Multimedia	0.0%	0.0%	2.5%	0.0%	0.0%	1.7%
Sewing plane machine	4.0%	11.1%	11.0%	4.0%	11.1%	8.5%
Modern Textile machine	4.0%	11.1%	0.0%	4.0%	11.1%	0.0%
Smart board	0.0%	0.0%	9.3%	0.0%	0.0%	5.9%
Car Engine	8.0%	0.0%	.8%	0.0%	0.0%	.8%
Mixer machine	0.0%	0.0%	2.5%	0.0%	0.0%	2.5%
Modern electric equipmentâ€™s	8.0%	0.0%	4.2%	8.0%	0.0%	5.1%
Otherâ€™s	0.0%	0.0%	.8%	0.0%	0.0%	.8%
Drawing tab	0.0%	11.1%	.8%	0.0%	0.0%	.8%
Digital board	4.0%	11.1%	0.0%	0.0%	22.2%	0.0%
CNG machine	0.0%	0.0%	1.7%	0.0%	0.0%	1.7%
Abutter	0.0%	0.0%	.8%	0.0%	0.0%	.8%
VFB	0.0%	0.0%	.8%	0.0%	0.0%	0.0%
Panel wiring	0.0%	0.0%	0.0%	0.0%	0.0%	.8%
Hull machine	0.0%	11.1%	0.0%	4.0%	0.0%	0.0%
Button machine	0.0%	0.0%	.8%	0.0%	11.1%	.8%
Utensils	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Otherâ€™s	0.0%	0.0%	.8%	0.0%	0.0%	.8%
Robotic machine	0.0%	0.0%	0.0%	4.0%	0.0%	0.0%
Embroider machine	0.0%	0.0%	0.0%	0.0%	0.0%	.8%

Type of TVET streams/programs

Name of the TVET stream/program	Type of TVET Institutions						
	Public		NGO		Private		Total
	Number	%	Number	%	Number	%	
Diploma	3	14.29	2	9.52	16	76.19	100
HSC (Vocational)/BM	3	100	0	0	0	0	100
SSC/Dakhil (Vocational)	11	16.92	2	3.08	52	80	100
National Skill Standard Basic (360-Hours)	8	12.12	5	7.58	53	80.30	100
Total	25	16.13	9	5.81	121	78.06	100

Average enrollment capacity of the Diploma institutions

Type of Diploma institutions	Name of the Diploma trades	Average enrolment capacity	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours required by the curriculum	
			Male	Female	Male	Female	Classroom	Lab
			Govt.	Architecture	200	124	76	122
	Automobile	200	173	27	175	25	1200	2400
	Civil	470	221	47	219	50	1283	2401
	Computer	501	125	40	124	44	1148	2666

Table-1.11: Average enrollment capacity of Diploma institutions by trades & type of institutions

Type of Diploma institutions	Name of the Diploma trades	Average enrolment capacity	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours required by the curriculum	
			Male	Female	Male	Female	Classroom	Lab
	Computer science & Electro Medical	200	102	98	105	95	1200	2400
	Electrical	305	149	27	157	27	1664	2079
	Electronics	361	103	31	105	30	1336	2337
	Environmental, Instrumentation & process Control	100	57	43	55	45	1200	2400
	Mechanical	437	195	39	196	40	1315	2401
	Mining & Mine survey	203	42	7	36	7	1224	2404
	Power	196	113	16	112	17	1449	2355
	Refrigeration & Air-conditioning	485	130	16	129	16	1212	2402
	Others	152	46	20	70	20	1224	2404
NGO	Civil	71	58	6	65	12	898	1713
	Computer	65	41	31	47	38	1222	2425
	Electrical	65	62	5	72	14	898	1697
	Electronics	25	19	9	24	10	1222	2402
	Mechanical	55	33	0	48	1	737	1346
	Refrigeration & Air-conditioning	20	22	0	16	13	1224	2404
	Others	34	29	9	23	19	1224	2404
Private	Architecture	16	7	3	3	2	1586	2477
	Architecture & Interior design	13	5	3	4	2	1462	1990
	Automobile	49	38	0	40	0	776	1036
	Civil	77	67	2	66	5	1278	1789
	Computer	69	54	17	56	13	1256	1848
	Computer science & Electro Medical	88	111	19	71	28	1801	2640
	Dental	27	9	9	9	12	1870	2823
	Electrical	81	85		85	2	1419	1982
	Electronics	16	12	1	8		1578	2690
	Fisheries	38	89	8	81	14	1220	2400
	Garments & Clothing	60	92	12	110	13	1220	2380
	Garments design & pattern making	6	8	3	6	1	1684	2250
	Laboratory	30	9	10	13	8	1969	2879
	Marine	20	23	0	23	0	1704	1600
	Mechanical	50	52	0	50		1425	1888
	Patient care	33	2	30	5	33	1175	2305
	Pharmacy	19	8	3	8	3	2411	3452
	Physiotherapy	23	4	2	4	4	1979	2634
	Printing & graphics design	30	18	10	17	4	1220	2380
	Refrigeration & Air-conditioning	13			4		434	517
	Surveying	13	3	0	10	0	1384	2074
	Others	39	39	9	37	9	1199	1654

Average academic performance of Diploma institutions by trades & type of institutions

Table-1.12: Average academic performance of Diploma institutions by trades & type of institutions														
Type of institution	Name of the Diploma trades	Average number of students appeared in 2018		Average result in 2018 (Number of students)				Average number of students appeared in 2019		Average result in 2019 (Number of students)				
		Male	Female	CGPA 2-2.5	CGP A 2.5-3	CGP A 3-3.5	CGPA 3.5-4	Male	Female	CGP A 2-2.5	CGP A 2.5-3	CGP A 3-3.5	CGP A 3.5-4	
Govt.	Architecture	118	72	30	51	40	29	113	74	32	43	27	25	
	Automobile	165	24	30	47	36	29	167	20	30	42	40	27	
	Civil	200	38	37	58	80	39	214	46	38	61	86	40	
	Computer	86	18	0	27	56	16	81	27	1	20	58	20	
Computer science & Electro Medical		99	92	31	49	38	28	94	91	31	44	22	27	
	Electrical	105	22	27	41	43	22	115	19	25	42	43	21	
	Electronics	97	26	16	33	42	17	90	30	16	36	39	16	
Environmental, Instrumentation & process Control		54	41	16	25	21	12	51	43	14	19	12	11	
	Mechanical	131	24	28	42	45	20	107	25	18	35	41	16	
	Mining & Mine survey	41	9	3	25	24	3	42	6	2	8	19	5	
	Power	101	17	18	30	38	16	106	22	17	38	40	16	
Refrigeration & Air-conditioning		127	17	17	37	35	23	130	17	17	38	38	19	
Total	Total	1324	400	253	465	498	254	1310	420	241	426	465	243	
%		1724		85.27 %	pass		14.73 %	1730		79.48 %	pass		14.05 %	
NGO	Civil	58	9	4	16	21	9	70	10	6	14	28	13	
	Computer	26	16	4	15	13	5	26	19	3	10	19	7	
	Electrical	67	6	3	24	21	9	82	10	3	29	27	8	
	Electronics	17	12	3	9	8	2	19	6	2	7	7	3	
	Mechanical	126	7	8	53	45	27	166	7	15	49	83	26	
	others	30	4	0	0	22	11	25	5	0	0	13	17	
Total	Total	324	54	22	117	130	63	388	57	29	109	177	74	
%%		378		87.83 %	pass		16.67 %	445	87.42 %	pass			16.63%	
Private	Architecture	12	3	1	7	3	1	12	6	2	7	5	2	
	Architecture & Interior design	9	4	2	5	3	1	9	3	3	4	4	2	
	Automobile	58	0	2	19	16	11	85	0	8	34	25	6	
	Civil	70	2	4	21	24	6	76	3	7	21	29	6	
	Computer	55	13	7	21	23	8	58	20	12	20	25	10	
	Computer science & Electro Medical		27	6	2	12	7	1	34	6	4	18	5	3
		Dental	9	8	2	3	7	2	10	6		5	7	2
		Electrical	100		10	35	27	11	99		12	34	33	6
		Electronics	19	1	2	5	9	1	22	1	1	8	7	2
		Fisheries	190	1	0	38	52	42	216	8		112	52	22
	Garments & Clothing Garments design & pattern making		92	11	18	27	36	20	110	13	38	45	29	10
		Laboratory	20	3	2	5	10	6	22	4	0	5	11	9
		Marine	13	10	6	2	6	6	11	7	0	3	7	6
		Mechanical	38	0	4	21	9	2	20	0	4	10	3	3
		Patient care	52	0	3	14	18	5	62		4	18	23	6
		Pharmacy	1	27	2	10	9	7	5	29	0	8	13	12
		Physiotherapy	8	3	1	2	4	2	7	3		1	4	3
		Printing & graphics design	4	2	0	1	1	2	4	3	0	1	2	1
		Surveying	18	10	7	7	9	4	16	4	1	8	6	5
		others	4	0	0	1	2	0	10	0	0	3	5	2
Total		Total	833	112	78	268	298	145	932	128	98	380	322	126
%			945		83.49 %	pass		15.34 %	1060	87.36 %	pass			11.89%

Average qualifications of the instructors of the Diploma institutions

Type of TVET institutions	Average number of instructors with Ph.D. degree	Average number of instructors with Masters degree	Average number of instructors with Bachelor s degree	Average number of instructors with Diploma degree	Average year of experience	Average number of courses the instructor takes	Average number of hours the instructor has to take per week	Average monthly salary (In Taka)
Public	0.03	0.08	0.70	0.19	17.71	11.07	37.67	43500.49
NGO	0	0.2	0.3	0.5	7.46	6.13	18.78	19536.13
Private	0.01	0.16	0.48	0.35	8.40	13.88	26.57	17820.40
Total	0.016	0.15	0.50	0.33	10.16	12.54	27.90	22809.56

Average enrollment capacity of HSC (Voc) institutions

Name of HSC (Voc.) Trade	Average enrolment capacity	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours required by the curriculum in a week	
		Male	Female	Male	Female	Classroom	Lab
Accounting	47	26	12	28	13	16	9
Auto mobile/Automotive	53	22	2	18	2	18	21
Banking	44	27	10	31	6	17	9
Clothing & Garments finishing	40	3	3	8	14	12	18
Computer operation & maintenance	48	25	12	26	13	13	13
Electrical works & maintenance	48	28	6	28	3	14	18
Electronic control & Communication	53	27	0	23	2	18	21
Entrepreneurship Development	46	31	13	30	11	15	6
Refrigeration & Air conditioning	50	11	.	13	.	3	12
Secretarial Science/Shorthand	50	32	11	41	9	28	4
Others	46	22	12	24	10	9	9

Average results of HSC (Vocational)/BM institutions

Name of HSC (Voc.) Trade All trades	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019	Average result in 2018 (Number of students)				Average result in 2019 (Number of students)			
					GP A 2.5 - 3.5	GP A 3.5 - 4.5	GPA 4.5-4.99	GP A 5	GP A 2.5 - 3.5	GP A 3.5 - 4.5	GPA 4.5-4.99	GP A 5
Accounting	20	24	18	22	1	8	10	1	1	7	16	1
Automobile/Automotive	23	19	29	9	4	11	19	11	1	5	11	5
Banking	26	29	22	26	2	9	12		1	13	15	
Clothing & Garments finishing	22	14	11	7		11				7		

Computer operation & maintenance	27	28	26	22	1	10	15	1	1	9	13	1
Electrical works & maintenance	26	28	25	23	7	16	9	5	6	12	13	5
Electronic control & Communication	23	20	34	10	5	16	20	4	2	4	5	3
Entrepreneurship Development	25	32	20	28	0	8	14	0	1	16	15	1
Machine tools operation & Maintenance	8	4	7	1		6	1				1	
Refrigeration & Air conditioning	35	36	6	18	4	2			8	10		
Secretarial Science/Shorthand	34	33	27	29	0	11	15	1	4	13	14	1
Others	27	20	21	18	2	10	10	0	1	9	10	
Total	296	287	246	213			125	23			113	17
%	96.96% pass in 2018		86.58% pass in 2019				43.55%	8.01%			53.05%	7.98%

Average qualifications of the instructors of the HSC (Vocational)/BM institutions

Type of TVET institution	Average number of instructors with PhD degree	Average number of instructors with Masters degree	Average number of instructors with Bachelor's degree	Average number of instructors with Diploma degree	Average years of experience	Average number of courses the instructor takes	Average number of hours the instructor has to take per week	Average monthly salary (In Taka)
Public	0.02	0.42	0.15	0.41	17.52	6.44	20.92	36624
NGO	0	0	0	0	0	0	0	0
Private	0	0.8	0.08	0.12	11.27	2.81	12.00	21012
Total	0.01	0.57	0.12	0.30	15.05	5	17.40	29980

Average enrolment capacity of the SSC/Dakhil (Voc) institutions

Name of SSC/Dakhil (Voc.) Trade	Average enrolment capacity	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours required by the curriculum in a week	
		Male	Female	Male	Female	Classroom	Lab/workshop
Agrobased food	38	12	10	12	11	8	13
Architectural drafting with CAD	30	4	9	10	6	22	26
Automotive	42	22	3	28	3	11	21
Building maintenance	37	21	6	24	8	13	16
Civil construction	41	27	7	31	7	12	20
Civil drafting with CAD	35	23	8	28	6	25	23
Computer & Information technology	42	23	13	24	16	15	23
Dress making	40	9	20	10	21	17	22
Electrical Maintenance works	35	26	9	28	7	13	36
Farm machinery	30	27	3	22	2	4	14
Fish Culture & Breeding	40	12	11	11	14	16	23
Food processing & preservation	37	11	11	14	16	16	19
Food & vegetable cultivation	40	14	6	22	18	5	4
General Electrical works	41	29	6	31	7	14	18
General Electronics	40	20	9	25	11	14	23
General mechanics	37	23	3	26	4	11	20

Name of SSC/Dakhil (Voc.) Trade	Average enrolment capacity	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours required by the curriculum in a week	
		Male	Female	Male	Female	Classroom	Lab/workshop
Livestock rearing & farming	40	28		17	12	16	24
Machine tools operation	40	0	0	0	0	4	45
Mchanical drfting with CAD	40	28	0	30	0	16	24
Poultry rearing & farming	40	12	14	27	14	16	9
Refrigeration & Air condition	40	21	9	31	7	15	26
Welding & Fabrication	36	17	2	16	1	8	22
Wood working	30	20	10	19	11	21	27
Others	30	14		24		4	45

Average results of SSC/Dakhil (Vocational) institutions

Name of SSC/Dakhil (Voc.) Trade	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019	Average result in 2018 (Number of students)				Average result in 2019 (Number of students)			
					GP A 2.5-3.5	GP A 3.5-4.5	GPA 4.5-4.99	GPA 5	GP A 2.5-3.5	GP A 3.5-4.5	GPA 4.5-4.9	GP A 5
Agro-based food	13	10	8	6	0	2	8	1	0	2	4	
Architectural drafting with CAD	20	7	20	12		5		2		10	3	
Automotive	25	18	24	20	3	9	10	7	2	12	9	6
Building maintenance	17	14	18	14	0	4	11	2	0	5	11	1
Civil construction	22	16	25	19	1	8	12	1	0	8	15	2
Civil drafting with CAD	28	25	28	24	0	11	9	10	0	13	10	2
Computer & Information technology	25	21	25	21	3	10	13	2	1	11	12	3
Dress making	16	14	15	13	0	5	11	1		5	9	1
Electrical Maintenance works	28	25	31	29	0	4	5	17	0	6	13	11
Farm machinery	30	26	24	20	0	7	19	0	0	10	10	0
Fish Culture & Breeding	20	18	21	17	0	0	18	0	0	0	17	0
Food processing & preservation	12	10	14	11	0	4	7	1	0	5	9	
Food & vegetable cultivation	12	6	17	14	0	4	1	1	0	10	4	0
General Electrical works	24	19	25	22	1	9	11	4	1	11	11	3
General Electronics	20	14	21	17		7	9	2		11	10	2

Table-1.18: Average results of SSC/Dakhil (Vocational) institutions by trade

Name of SSC/Dakhil (Voc.) Trade	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019	Average result in 2018 (Number of students)				Average result in 2019 (Number of students)			
					GP A 2.5-3.5	GP A 3.5-4.5	GPA 4.5-4.99	GPA 5	GP A 2.5-3.5	GP A 3.5-4.5	GPA 4.5-4.9	GP A 5
					General mechanics	21	17	21	16		7	10
Livestock rearing & farming	25	23	26	22			23			1	21	
Mechanical drafting with CAD	23	23	29	28			23				28	
Poultry rearing & farming	8	6	14	13	0	4	2	0	0	15	5	0
Refrigeration & Air condition	15	13	19	15	1	9	5	2	1	10	9	3
Welding & Fabrication	19	10	23	17	0	4	8	0	0	9	13	0
Wood working	13	8	24	15	0	5	3	0	1	10	3	1
Total	436	343	472	385			218	56			235	38
%	78.67% pass in 2018		81.57% pass in 2019				63.56%	16.33			61.04	9.87

Average enrolment capacity of the public SSC/Dakhil (Voc) institutions

Name of SSC/Dakhil (Voc.) Trade	Average enrolment capacity	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours required by the curriculum in a week	
		Male	Female	Male	Female	Classroom	Lab/workshop
Agro-based food	40	13	2	13	3	16	21
Architectural drafting with CAD	30	4	9	10	6	22	26
Automotive	60	39	2	41	2	14	20
Building maintenance	38	22	4	28	5	12	17
Civil construction	38	30	3	31	5	19	21
Civil drafting with CAD	40	21	11	26	11	26	22
Computer & Information technology	56	35	9	38	8	17	22
Dress making	38	3	19	6	22	12	16
Electrical Maintenance works	30	27	3	26	4	21	27
Farm machinery	30	27	3	22	2	4	14
Fish Culture & Breeding	40	11	5	14	5	16	21
Food processing & preservation	40	7	15	8	20	14	16
General Electrical works	49	35	5	36	6	13	18
General Electronics	50	30	9	33	9	16	21
General mechanics	36	29	1	31	1	13	16
Refrigeration & Air condition	50	18	13	41	12	17	21
Welding & Fabrication	30	18	2	11	2	13	20
Wood working	30	20	10	19	11	21	27

Average enrolment capacity of all the private SSC/Dakhil (Voc) institutions

Name of SSC/Dakhil (Voc.) Trade	Average enrolment capacity	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours required by the curriculum in a week	
		Male	Female	Male	Female	Classroom	Lab/workshop
Automotive	40	18	5	26	3	11	16
Computer & Information technology	40	10	10	12	22	11	32
Electrical Maintenance works	40	25	15	30	10	4	45
General Electrical works	40	25	8	35	11	8	26
General Electronics	40	11	8	26	9	17	19
General mechanics	40	13	6	16	4	4	29
Machine tools operation	40	0	0	0	0	4	45
Welding & Fabrication	40	0	0	0	0	4	45

Average enrolment capacity of the NGO SSC/Dakhil (Voc) institutions

Name of SSC/Dakhil (Voc.) Trade	Average enrolment capacity	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours required by the curriculum in a week	
		Male	Female	Male	Female	Classroom	Lab
Agro-based food	37	12	12	12	13	5	10
Automotive	36	18	4	26	3	10	24
Building maintenance	37	21	6	23	9	13	16
Civil construction	42	26	9	31	8	9	20
Civil drafting with CAD	30	25	5	30	0	24	23
Computer & Information technology	41	24	14	25	17	15	23
Dress making	40	10	20	11	21	18	23
Fish Culture & Breeding	40	13	17	7	22	16	24
Food processing & preservation	36	12	10	17	14	17	21
Food & vegetable cultivation	40	14	6	22	18	5	4
General Electrical works	40	28	7	31	8	15	18
General Electronics	37	19	9	24	12	14	24
General mechanics	37	23	4	25	6	12	21
Livestock rearing & farming	40	28		17	12	16	24
Mechanical drafting with CAD	40	28	0	30	0	16	24
Poultry rearing & farming	40	12	14	27	14	16	9
Refrigeration & Air conditioning	30	23	3	25	3	13	31
Welding & Fabrication	40	26	5	30	1	4	14
Others	30	14		24		4	45

Average results of public SSC/Dakhil (Vocational) institutions

Name of SSC/Dakhil (Voc.) Trade	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019	Average result in 2018 (Number of students)				Average result in 2019 (Number of students)			
					GPA 2.5-3.5	GPA 3.5-4.5	GPA 4.5-4.99	GPA 5	GPA 2.5-3.5	GPA 3.5-4.5	GPA 4.5-4.9	GPA 5
Agro-based food	12	9	9	5	0	0	7	2	0	0	4	1
Architectural drafting with CAD	20	7	20	12		5		2		10	3	
Automotive	36	25	33	27	4	15	9	2	1	19	11	2
Building maintenance	20	16	22	16	0	7	10	2	0	6	12	1
Civil construction	24	19	31	26		10	8	2	0	12	14	1
Civil drafting with CAD	30	29	29	26	0	5	14	10	0	8	16	2
Computer & Information technology	40	26	34	28	6	9	14	1	1	24	9	2
Dress making	13	10	18	15	0	2	8		0	4	11	1
Electrical Maintenance works	25	20	32	30	0	8	9	3	0	11	18	1

Table-1.18A-Govt: Average results of SSC/Dakhil (Vocational) institutions by trade & type of institution												
Name of SSC/Dakhil (Voc.) Trade	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019	Average result in 2018 (Number of students)				Average result in 2019 (Number of students)			
					GPA 2.5-3.5	GPA 3.5-4.5	GPA 4.5-4.99	GPA 5	GPA 2.5-3.5	GPA 3.5-4.5	GPA 4.5-4.9	GPA 5
Farm machinery	30	26	24	20	0	7	19	0	0	10	10	0
Fish Culture & Breeding	14	10	13	9	0	0	10	0	0	0	9	0
Food processing & preservation	15	11	15	10	0	4	7		0	1	9	0
General Electrical works	33	27	33	30	2	11	14	2	3	17	12	1
General Electronics	30	17	32	24	1	12	9	2	1	15	12	3
General mechanics	19	12	25	17	0	6	7	0	0	12	7	
Refrigeration & Air condition	18	16	23	19	1	7	7	2	0	9	12	5
Welding & Fabrication	21	13	21	16	0	6	13	0	0	11	11	0
Wood working	13	8	24	15	0	5	3	0	1	10	3	1
Total	413	301	438	345			168	30			183	21
%	72.88% pass in 2018		78.77% pass in 2019				65.78%				59.13%	

Average results of private SSC/Dakhil (Voc) institutions

Table-1.18B-Private: Average results of SSC/Dakhil (Vocational) institutions by trade & type of institution												
Name of SSC/Dakhil (Voc.) Trade	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019	Average result in 2018 (Number of students)				Average result in 2019 (Number of students)			
					GPA 2.5-3.5	GPA 3.5-4.5	GPA 4.5-4.99	GPA 5	GPA 2.5-3.5	GPA 3.5-4.5	GPA 4.5-4.9	GPA 5
Automotive	29	28	31	31			1	27			2	29
Electrical Maintenance works	30	30	29	28	0	0	0	30	0	0	7	21
General Electrical works	31	31	30	30	0	0	0	31	0	0	5	25
General mechanics	31	31	32	32				31				32
Total	121	120	122	121			1	119			14	107
%	99.17% pass in 2018		99.18% pass in 2019				100%				100%	

Average results of NGO SSC/Dakhil (Voc) institutions

Table-1.18C-NGO: Average results of SSC/Dakhil (Vocational) institutions by trade & type of institution												
Name of SSC/Dakhil (Voc.) Trade	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019	Average result in 2018 (Number of students)				Average result in 2019 (Number of students)			
					GPA 2.5-3.5	GPA 3.5-4.5	GPA 4.5-4.99	GPA 5	GPA 2.5-3.5	GPA 3.5-4.5	GPA 4.5-4.9	GPA 5
Agro-based food	13	11	7	6	0	3	8	1	0	3	4	0
Automotive	17	13	17	13	2	5	13	0	2	7	9	2
Building maintenance	16	13	16	13	0	4	11	2	0	4	10	1
Civil construction	21	15	23	17	1	7	14	1	0	7	16	3
Civil drafting with CAD	25	20	27	21		17	3			18	3	
Computer & Information technology	23	20	24	20	1	10	12	3	1	9	13	4
Dress making	17	15	15	13	0	6	12	1		5	9	1
Fish Culture & Breeding	25	25	28	25			25				25	
Food processing & preservation	11	10	13	12	0	4	8	2	0	6	9	1
Food & vegetable cultivation	12	6	17	14	0	4	1	1	0	10	4	0
General Electrical works	21	16	23	19	0	8	10	2	0	9	11	1
General Electronics	16	13	16	13	0	5	10	1		8	9	1
General mechanics	21	17	18	14	1	8	11	2	0	7	10	2
Livestock rearing & farming	25	23	26	22			23			1	21	
Mechanical drafting with CAD	23	23	29	28			23				28	
Poultry rearing & farming	8	6	14	13	0	4	2	0	0	15	5	0
Refrigeration & Air condition	12	11	15	11		13	3		1	10	3	1
Welding & Fabrication	18	7	25	18		1	6			7	15	
Total	324	264	353	292			195	16			204	17
%	81.48% pass in 2018		82.72% pass in 2019				79.92%				75.68%	

Qualifications of the instructors of the SSC/Dakhil (Voc) institutions

Type of TVET institution	Average number of instructors with PhD degree	Average number of instructors with Masters degree	Average number of instructors with Bachelor's degree	Average number of instructors with Diploma degree	Average years of experience	Average number of courses the instructor takes	Average number of hours the instructor has to take per week	Average monthly salary (In Taka)
Public	0.12	0.18	0.68	0	20.55	8.65	21.19	34578
NGO	0.33	0.31	0.36	0	9	3.9	11.54	20576
Private	0.17	0.29	0.51	0.03	14.18	4.68	26.21	16888
Total	0.17	0.26	0.54	0.20	15.09	5.74	24.18	21407

Average enrollment capacity of National Skill Standard Basic (NSSB) institutions

Type of TVET institution	Name of trades/technology of National Skill Standard Basic (360-Hours)	Average enrolment capacity per institution	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours in a week		
			Male	Female	Male	Female	Classroom	Lab	
Govt.	Apparel Merchandising	30	8	2	7	1	1.50	6	
	Auto mechanics	83	34	22	39	21	3.09	7	
	Building & Architectural Drafting with AutoCAD	30	79	11	71	19	6.00	12	
	Computer operation /programming	98	74	45	76	37	3.80	11	
	Dress making & Tailoring	30		38		24	4.00	12	
	Electrical House Wiring	43	33	10	35	9	4.75	12	
	Furniture & Cabinet making	30	65	25	58	32	6.00	12	
	General Electrician	30	27	3	27	3	6.00	12	
	Graphics design & Multimedia programming	27	36	7	32	13	5.00	12	
	Hardware & Networking	20	13	0	11	0	3.00	12	
	Machinist	35		88		119	47	6.00	12
	Maintenance of Electrical Equipment	20	7	0	6	0	3.00	12	
	Mobile phone servicing	60	10	0	6	0	4.00	12	
	Refrigeration & Air Conditioning	50	48	13	28	7	6.00	12	
Welding & Fabrication	40					4.00	12		
Other Trades	232	181	135	136	58	5.00	13		
NGO	Arc & gas Welding	110	73	37	17	0	5.00	10	
	Auto mechanics	50	63	1	73	1	5.67	11	
	Civil construction	30	53	7	50	10	120.00	240	
	Computer operation /programming	55	37	32	30	27	63.00	126	
	Database programming	80	15	0	0	0	6.00	12	
	Dress making & Tailoring	57	14	30	15	30	43.67	87	
	Electrical House Wiring	57	53	7	60	10	43.67	87	
	General Electrician	20	15		31	5	6.00	12	
Industrial Sewing Machine & Maintenance	60	48	77	45	80	63.00	126		

Type of TVET institution	Name of trades/technology of National Skill Standard Basic (360-Hours)	Average enrolment capacity per institution	Average enrolment in 2018		Average enrolment in 2019		Average number of class hours in a week	
			Male	Female	Male	Female	Classroom	Lab
	Maintenance of Electrical Equipment	30	48	12	49	11	120.00	240
	Masonry & rod binding	60	48	19	18	4	5.00	10
	Mobile phone servicing	53	85	20	59	18	5.50	11
	Motor cycles & Mishuk Mechanics	25	100		97		6.00	12
	Plumbing & pipe fitting	52	57	31	55	4	5.67	11
	Radio & Television servicing	60	114	6	112	8	6.00	12
	Refrigeration & Air Conditioning	63	106	14	98	7	34.25	69
	Secretarial Sciences	20	15		32		6.00	12
	Welding & Fabrication	20	13		24		6.00	12
	Other Trades	53	46	37	69	40	20.00	40
Private	Aminship (Surveyor)	60	15	0	17	0	2.50	14
	Apparel Merchandising	47	40	17	38	14	15.17	33
	AutoCAD	34	12	6	17	8	5.00	11
	Bamboo, Cane & Mat Industry	40	0	0	0	0	0.00	0
	Computer operation /programming	80	64	38	70	34	14.88	40
	Database programming	86	61	43	49	37	8.68	26
	Dress making & Tailoring	34	11	24	9	22	15.50	89
	Electrical House Wiring	32	55	3	50	6	20.14	59
	Food & beverage production/Service	36	25	18	24	26	5.00	10
	General Electrician	32	64	14	45	12	10.67	22
	Graphics design & Multimedia programming	50	30	7	31	9	10.76	23
	Hardware & Networking	39	20	4	21	5	5.64	11
	Industrial Sewing Machine & Maintenance	31	2	24	3	23	3.00	5
	Interior Decoration (Gypsum Decoration)	40	17	7	16	5	13.00	11
	Leather goods & Footwear/Technology	40	0	90	0	98	20.50	48
	Machinist	10	22	1	47	30	6.00	24
	Maintenance of Electrical Equipment	40	0	0	0	0	0.00	0
	Masonry & rod binding	23	20		50	21	6.00	21
	Mobile phone servicing	31	49	2	47	2	33.67	100
	Plumbing & pipe fitting	26	60	0	78	15	33.60	127
	Radio & Television servicing	40	15	0	10	0	10.00	14
	Refrigeration & Air Conditioning	23	135	0	118	0	71.67	193
	Secretarial Sciences	60	13	8	19	6	2.00	10
	Tiles setting & Fitting	23	23	1	59	23	6.00	22
	Welding 6G	30	40	0	40	0	20.00	48
	Welding & Fabrication	25	24	0	93	11	6.00	24
	Other Trades	79	48	25	47	23	10.37	29

Average results of NSSB students

Table-1.21: Average results of NSSB institutions by trade & type of institution					
Type of TVET institution	Name of trade of National Skill Standard Basic (360-Hours)	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019
Govt.	Apparel Merchandising	17	16	17	16
	Auto mechanics	40	19	33	11
	Computer operation /programming	166	166	169	169
	Dress making & Tailoring	38	24	37	22
	Electrical House Wiring	60	53	51	45
	General Electrician	79	79	69	69
	Graphics design & Multimedia programming	43	43	41	41
	Hardware & Networking	12	12	10	9
	Industrial Sewing Machine & Maintenance	90	90	90	90
	Maintenance of Electrical Equipment	7	6	7	6
	Masonry & rod binding	90	90	85	85
	Mobile phone servicing	20	12	20	12
	Motor cycles & Mishuk Mechanics	122	122	107	107
	Plumbing & pipe fitting	90	90	84	84
	Refrigeration & Air Conditioning	90	80	48	47
	Other Trades	228	140	215	128
	Total		1070	1042	976
%		97.38% pass in 2018		96.41% pass in 2019	
NGO	Arc & gas Welding	99	17	93	17
	Arc Welding	24	24	24	24
	Auto mechanics	73	73	68	67
	Civil construction	56	56	55	54
	Computer operation/ programing	67	56	63	47
	Data base programing	35	17	22	17
	Dress making & Tailoring	43	43	43	43
	Electrical House Wiring	88	65	87	60
	General Electrician	32	31	31	30
	Industrial Sewing Machine & Maintenance	119	118	119	118
	Maintenance of Electrical Equipment	56	55	54	54
	Masonry & rod binding	36	20	31	19
	Mobile phone servicing	103	72	102	70
	Motor cycles & Mishuk Mechanics	100	97	94	92
	Plumbing & pipe fitting	54	44	49	42
	Radio & Television servicing	120	120	120	120
	Refrigeration & Air Conditioning	95	87	92	82
	Tiles setting & Fitting	30	24	26	22
	Welding 4G	15	0	13	0
	Welding 6G	60	59	60	59
Other Trades	74	74	72	72	
Total		1379	1152	1318	1109
%		83.54% pass in 2018		84.14% pass in 2019	
Private	Air Hostess & Cabin Crew	38	38	24	24
	Aminship (Surveyor)	8	8	7	3

Type of TVET institution	Name of trade of National Skill Standard Basic (360-Hours)	Average number of students appeared in 2018	Average number of students passed in 2018	Average number of students appeared in 2019	Average number of students passed in 2019
	Apparel Merchandising	53	45	53	44
	Arc Welding	27	23	23	23
	AutoCAD	22	18	21	16
	Computer operation /programming	100	99	95	91
	Data base programming	84	80	84	76
	Diesel Mechanics	150	130	135	125
	Dress making & Tailoring	29	27	26	26
	Electrical House Wiring	68	55	75	62
	Food & beverage production/Service	49	49	48	48
	General Electrician	38	11	38	11
	Graphics design & Multimedia programming	42	42	40	39
	Hardware & Networking	27	27	28	28
	Housekeeping	45	45	43	42
	Industrial Sewing Machine & Maintenance	15	15	15	14
	Machinist	52	52	55	52
	Masonry & rod binding	45	45	38	36
	Mobile phone servicing	38	37	44	44
	Plumbing & pipe fitting	78	78	75	75
	Radio & Television servicing	15	10	15	10
	Refrigeration & Air Conditioning	110	110	108	108
	Secretarial Sciences	21	21	20	20
	Tiles setting & Fitting	67	67	66	62
	Welding & Fabrication	48	42	48	38
	Other Trades	78	68	75	62
Total %		1347	1242	1299	1179
		92.2% pass in 2018		90.76% pass in 2019	

Average qualifications of the instructors of the NSSB institutions

Type of TVET institution	Average number of instructors with Ph.D. degree	Average number of instructors with Masters degree	Average number of instructors with Bachelors degree	Average number of instructors with Diploma degree	Average year of experience	Average number of courses the instructor takes	Average number of hours the instructor has to take per week	Average monthly salary (In Taka)
Public	0.17	0.21	0.62	0	11	3.67	20.13	19223
NGO	0.08	0.51	0.42	0	8.38	3.34	15.33	22385
Private	0.26	0.36	0.38	0	10.94	4.71	28.39	15275
Total	0.22	0.35	0.43	0	10.53	4.34	25.05	17087

Existing Diploma trades which are most in demand and new Diploma trades which have promising future market demand

Table-1.23a: Extent of market demand by existing & future Diploma trades								
Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Automobile	3	9	3	8	3	10	3	9
Civil	13	9	13	8	13	9	13	9
Computer	13	9	13	9	13	9	13	9
Data Telecommunication & Networking	1	7	1	8	1	8	1	9
Dental	5	8	5	8	5	8	5	7
Electrical	13	9	13	9	13	9	13	9
Electronics	3	8	3	8	3	8	3	9
Garments & Clothing	2	8	2	7	2	7	2	9
Garments design & pattern making	1	8	1	8	1	10	1	10
Jute	1	7	1	7	1	9	1	9
Laboratory	4	9	4	7	4	9	4	8
Mechanical	11	8	11	8	11	8	11	8
Medical	6	8	6	4	6	9	6	4
Patient care	2	8	2	8	2	8	2	8
Pharmacy	4	8	4	7	4	8	4	7
Physiotherapy	3	9	3	9	3	10	3	10
Power	3	7	3	9	3	7	3	8
Surveying	1	8	1	6	1	10	1	8
Wet processing	1	7	1	8	1	8	1	9
others	14	9	14	9	14	9	14	9
Five new trades which have promising future market demand								
Architecture	3	8	3	8	3	9	3	8
Automobile	1	6	1	7	1	6	1	7
Civil	5	9	5	8	5	9	5	8
Computer	3	10	3	9	3	10	3	9
Computer science & Electro Medical	3	8	3	8	3	8	3	9
Data Telecommunication & Networking	2	8	2	8	2	9	2	8
Dental	5	8	5	6	5	8	5	6
Electrical	3	8	3	9	3	9	3	9
Electronics	3	7	3	7	3	7	3	8
Environmental, Instrumentation & process Control	2	7	2	8	2	8	2	8
Garments & Clothing	1	8	1	10	1	10	1	10
Glass	2	6	2	9	2	8	2	10

Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Integrated Medicine	1	10	1	10	1	10	1	10
Laboratory	3	8	3	7	3	8	3	7
Marine	3	7	3	9	3	7	3	10
Mechanical	3	8	3	9	3	9	3	9
Mechatronics	2	6	2	10	2	6	2	10
Medical	3	7	3	5	3	7	3	5
Patient care	2	8	2	7	2	8	2	7
Pharmacy	3	7	3	5	3	7	3	6
Physiotherapy	1	8	1	8	1	10	1	10
Power	1	5	1	10	1	6	1	10
Printing & graphics design	1	9	1	9	1	8	1	7
Radiology & Imaging	1	10	1	10	1	10	1	10
Surveying	1	7	1	8	1	9	1	10
Telecommunication	1	7	1	10	1	7	1	10
others	35	9	35	9	35	9	35	9

Extent of market demand by TVET trade (HSC)

Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Auto mobile/Automotive	2	8	2	7	2	9	2	7
Clothing & Garments finishing	1	8	1	8	1	8	1	8
Computer operation & maintenance	2	8	2	7	2	8	2	7
Electrical works & maintenance	2	8	2	6	2	7	2	6
Electronic control & Communication	3	8	3	7	3	8	3	7
Machine tools operation & Maintenance	1	10	1	10	1	10	1	10
Welding & fabrication	2	9	2	8	2	9	2	8
Yarn & Fabric Manufacturing	1	9	1	8	1	9	1	8
Five new trades which have promising future market demand								
Accounting	0		0		0		0	
Auto mobile/Automotive	1	8	1	8	1	8	1	8

Table-1.23b: Extent of market demand by existing & future HSC (Voc) trades

Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Clothing & Garments finishing	1	8	1	8	1	8	1	8
Computer operation & maintenance	3	8	3	8	3	9	3	9
Electronic control & Communication	1	8	1	8	1	8	1	8
Welding & fabrication	1	8	1	8	1	8	1	8
Others	8	9	8	6	8	9	8	8

Extent of market demand by TVET trade (SSC)

Table-1.23c: Extent of market demand by existing & future SSC/Dakhil (Voc) trades

Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Agro-based food	4	7	4	7	4	9	4	8
Architectural drafting with CAD	1	8	1	9	1	8	1	9
Automotive	15	9	15	9	15	9	15	9
Building maintenance	17	9	17	9	17	9	17	9
Ceramics	1	8	1	8	1	7	1	7
Civil construction	22	8	22	8	22	9	22	8
Computer & Information technology	45	9	45	9	45	9	45	9
Dress making	19	8	19	8	19	9	19	9
Dyeing, printing, finishing	1	7	1	8	1	7	1	8
Electrical Maintenance works	9	9	9	9	9	9	9	9
Fish Culture & Breeding	2	9	2	8	2	9	2	8
Food processing & preservation	10	8	10	9	10	9	10	9
Food & vegetable cultivation	1	6	1	7	1	8	1	7
General Electrical works	40	9	40	9	40	9	40	9
General Electronics	27	8	27	9	27	9	27	9
General mechanics	29	8	29	9	29	9	29	9
Glass	3	8	3	9	3	10	3	10
Livestock rearing & farming	2	8	2	5	2	8	2	5
Machine tools operation	2	9	2	9	2	9	2	9
Mechanical drafting with CAD	4	7	4	8	4	9	4	9
Plumbing & pipe fitting	2	8	2	9	2	10	2	10
Poultry rearing & farming	3	9	3	6	3	9	3	6
Refrigeration & Air condition	8	8	8	9	8	9	8	9

Table-1.23c: Extent of market demand by existing & future SSC/Dakhil (Voc) trades

Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Welding & Fabrication	4	8	4	10	4	10	4	10
Others	15	9	15	8	15	10	15	9
Five new trades which have promising future market demand								
Agro-based food	4	8	4	9	4	8	4	9
Architectural drafting with CAD	3	8	3	9	3	8	3	9
Automotive	11	8	11	9	11	9	11	9
Building maintenance	8	8	8	8	8	9	8	9
Ceramics	1	8	1	8	1	8	1	8
Civil construction	13	9	13	9	13	9	13	9
Civil drafting with CAD	3	9	3	9	3	9	3	8
Computer & Information technology	27	9	27	9	27	9	27	9
Dress making	15	9	15	9	15	9	15	9
Dyeing, printing, finishing	5	8	5	9	5	9	5	9
Electrical Maintenance works	6	8	6	9	6	9	6	9
Farm machinery	4	8	4	10	4	9	4	10
Fish Culture & Breeding	2	10	2	7	2	10	2	7
Food processing & preservation	16	8	16	9	16	9	16	9
Food & vegetable cultivation	1	8	1	9	1	9	1	9
General Electrical works	17	8	17	8	17	9	17	9
General Electronics	16	9	16	9	16	9	16	9
General mechanics	16	8	16	9	16	9	16	9
Glass	1	9	1	9	1	9	1	9
Livestock rearing & farming	1	9	1	8	1	10	1	10
Machine tools operation	3	8	3	8	3	9	3	10
Mechanical drafting with CAD	3	7	3	8	3	9	3	9
Patient care technique	2	9	2	8	2	9	2	9
Plumbing & pipe fitting	6	9	6	9	6	9	6	9
Poultry rearing & farming	5	9	5	9	5	9	5	9
Refrigeration & Air condition	10	8	10	9	10	9	10	9
Welding & Fabrication	13	8	13	9	13	9	13	9
Others	74	9	74	8	74	9	74	9

Extent of market demand by TVET trade (NSS)

Table-1.23d: Extent of market demand by existing & future NSSB trades								
Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Aminship (Surveyor)	6	6	6	6	6	7	6	6
Apparel Merchandising	3	8	3	8	3	9	3	9
AutoCAD	11	8	11	8	11	8	11	9
Auto mechanics	3	7	3	8	3	9	3	9
Aviation Management	1	7	1	8	1	8	1	8
Building & Architectural Drafting with AutoCAD	2	9	2	10	2	10	2	10
Civil construction	2	7	2	8	2	7	2	7
Computer operation /programming	44	9	44	8	44	9	44	9
Database programming	23	8	23	9	23	9	23	9
Diesel Mechanics	2	8	2	9	2	9	2	9
Drafting civil	2	8	2	10	2	9	2	10
Dress making & Tailoring	8	8	8	6	8	8	8	7
Electrical House Wiring	21	8	21	8	21	9	21	8
Food & beverage production/Service	2	7	2	8	2	7	2	8
Food processing & preservation	3	6	3	8	3	8	3	9
General Electrician	11	8	11	9	11	9	11	9
General Mechanics	3	7	3	7	3	9	3	8
Graphics design & Multimedia programming	36	8	36	9	36	9	36	9
Hardware & Networking	20	8	20	9	20	9	20	9
Housekeeping	1	10	1	10	1	10	1	10
Interior Decoration (Gypsum Decoration)	1	8	1	9	1	8	1	10
Machinist	1	9	1	8	1	8	1	9
Mobile phone servicing	6	8	6	7	6	8	6	7
Plumbing & pipe fitting	3	8	3	9	3	10	3	10
Radio & Television servicing	1	8	1	9	1	9	1	9
Refrigeration & Air Conditioning	4	7	4	8	4	8	4	9
Ship Fabrication	1	4	1	8	1	5	1	9
Travel ,Tourism & Ticketing	1	9	1	7	1	10	1	8
Welding 4G	1	8	1	8	1	8	1	8
Welding & Fabrication	2	8	2	9	2	8	2	9
Work study production Planning & apparel manufacturing	1	8	1	9	1	8	1	9
Other Trades	60	8	60	8	60	9	60	9

Table-1.23d: Extent of market demand by existing & future NSSB trades

Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Five new trades which have promising future market demand								
Aminship (Surveyor)	3	8	3	8	3	9	3	8
Arc Welding	1	5	1	5	1	8	1	5
AutoCAD	7	7	7	9	7	9	7	10
Auto mechanics	4	8	4	8	4	9	4	9
Building & Architectural Drafting with AutoCAD	1	9	1	5	1	9	1	5
Civil construction	1	7	1	8	1	8	1	8
Computer operation /programming	18	9	18	8	18	9	18	8
Data base programming	14	9	14	9	14	9	14	9
Dress making & Tailoring	5	8	5	8	5	9	5	8
Electrical House Wiring	10	8	10	8	10	8	10	8
Food & beverage production/Service	3	7	3	8	3	8	3	8
Food processing & preservation	2	8	2	9	2	9	2	9
General Electrician	4	7	4	8	4	9	4	9
General Mechanics	3	8	3	8	3	8	3	8
Graphics design & Multimedia programming	27	8	27	9	27	9	27	9
Hardware & Networking	14	9	14	9	14	9	14	9
Housekeeping	2	7	2	7	2	7	2	8
Interior Decoration (Gypsum Decoration)	1	8	1	7	1	8	1	8
Leather goods & Footwear/Technology	3	7	3	7	3	8	3	7
Machinist	1	9	1	8	1	6	1	6
Mobile phone servicing	11	8	11	9	11	9	11	9
Motor cycles & Mishuk Mechanics	1	8	1	7	1	8	1	7
Plumbing & pipe fitting	2	8	2	9	2	8	2	9
Radio & Television servicing	2	9	2	7	2	10	2	7
Refrigeration & Air Conditioning	1	8	1	8	1	8	1	8
Ship Fabrication	1	4	1	8	1	5	1	9
Travel ,Tourism & Ticketing	1	10	1	10	1	10	1	10
Welding 4G	2	8	2	7	2	9	2	9
Welding 6G	1	10	1	6	1	10	1	7
Welding & Fabrication	1	7	1	7	1	6	1	6

Table-1.23d: Extent of market demand by existing & future NSSB trades								
Five existing trades which are most in demand	Extent of market demand currently (Scale 1 to 10)				Extent of market demand currently (Scale 1 to 10)			
	Domestically		Internationally		Domestically		Internationally	
	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)	Number of institution reporting	Average score (1-10)
Work study production Planning & apparel manufacturing	1	9	1	9	1	9	1	9
Other Trades	133	8	133	8	133	9	133	9

Existing Industry-TVET Linkage

Table-1.24: Existing Industry-TVET Linkage		
Industry-TVET Linkage	No. of "Yes" cases	No. of "No" cases
Attachment/linkage of TVET institution with the industries	84 (54.2%)	71
Average duration of this attachment/linkage in months	113.24	
Apprenticeship offered by the TVET institutions	79 (53.4%)	69
Whether this apprenticeship is salaried	26 (32.9%)	53
Percentage of students who passed in 2019 got an apprenticeship	64.40	
Percentage of students who passed in 2018 got an apprenticeship	63.64	

Teachers' assessment rated by the Principal/Head of the institution

Assessment of Teachers	Responses on a Scale of 1 to 10	
	Number of TVET institutions reporting	Average score
How do you rate the proficiency in teaching of your teaching staff?		
(a) The teachers understand the difference in pedagogy between general education and technical & vocational education	155	7.52
(b) Proportion of teachers who received training in TVET pedagogy	145	9.30
The teachers are well versed in theoretical aspects of the subjects taught	154	7.69
The teachers are well versed in practical aspects of the subjects taught	155	7.68
Generally the syllabuses are fully covered	155	8.90
The teachers are organized and prepared for every class.	155	7.71
The teachers explain the material clearly and in ways that are easy to understand, offer alternative explanations or additional examples, and clear up	155	7.99
The teachers use a variety of activities (discussion, group work, lecture, labs, technology, etc.) during class time	155	7.87
The syllabus is explained at the beginning of the course.	155	8.37
The teachers encourage creativity in the class works and assignments	155	7.42
The teachers have adequate educational background	155	7.94
The performance of the teachers in the national exams (SSC or HSC) is good	155	7.88

Impact of COVID-19 on TVET Institutions

1. How many days the TVET institution was closed due to COVID-19 (excluding weekly & Government holidays)?	Number of reporting TVET institutions	Average number of days TVET institution was closed
	155	117.57 i.e. 6 wms
2. Reasons for the closure of the TVET institution:	Number of reporting TVET institutions	%
Government lockdown=1	125	80.65
Despite lifting of lockdown, the authority has decided not to open the institution in consideration of health risk=2	29	18.70
Closed down due to very poor attendance of the students=3	1	0.65
Others (specify)=4	0	0
Total Cases of Q. 2		100.00
3. Ramification/form of the impact due to COVID-19:	Number of reporting TVET institutions	%
Reduction in the salary of the employees=1	23	14.84
Firing/retrenchment of the staff/employees=2	6	3.87
Lockout/closure of the institution=3	44	28.39
Reduction of fringe benefits=4	3	1.94
Apprenticeship could not be provided due to non-existence of correspondence with other institutions=5	14	9.03
The institution has suffered a loss financially=6	64	41.29

Others (Specify)=7	1	0.65
Total Cases of Q. 3		100.00
4. How have you adjusted/will adjust financial loss incurred from closure of the institution due to COVID-19?	Number of reporting TVET institutions	%
Government assistance=1	22	14.19
NGO assistance=2	2	1.29
Borrowing=3	48	30.97
sack employees=4	4	2.58
Decrease other opportunities=5	30	19.35
Decrease office expense=6	35	22.58
Others (Specify)=7	14	9.03
Total Cases of Q. 4		100.00

2. TVET Graduates

SECTION: C.1: LEVEL OF EDUCATION

TVET Programs	Number of Graduates	%
Diploma	44	13.58
HSC (Vocational)	8	2.47
SSC/Dakhil (Vocational)	126	38.89
NSS Basic Course	146	45.06
All Programs	324	100

SECTION C.2: DIPLOMA- CURRICULUM & ACADEMIC PERFORMANCE

	TVET program & trade	Count	Column Valid N %
Diploma	Automobile	2	4.9%
	Civil	8	19.5%
	Construction	1	2.4%
	Electrical	6	14.6%
	Electronics	2	4.9%
	Fisheries	1	2.4%
	Garments design & pattern making	1	2.4%
	Laboratory	3	7.3%
	Marine	1	2.4%
	Mechanical	4	9.8%
	Medical	2	4.9%
	Patient care	2	4.9%
	Pharmacy	3	7.3%
Others	5	12.2%	
Total Diploma		41	
HSC(Voc/BM)	Computer	1	100.0%
SSC(voc)	Agricultural	0	0.0%
Basic course	Aircraft Maintenance(Avionics)	4	9.1%
	Architecture	3	6.8%

	TVET program & trade	Count	Column Valid N %
	Automobile	2	4.5%
	Ceramics	1	2.3%
	Chemical	1	2.3%
	Civil	3	6.8%
	Computer	7	15.9%
	Construction	1	2.3%
	Electrical	7	15.9%
	Electronics	6	13.6%
	Environmental, Instrum. & process Control	4	9.1%
	Food	2	4.5%
	Jute	1	2.3%
	Mechanical	1	2.3%
	others	1	2.3%
	Chemical	1	100.0%

SECTION C.3-6: ACADEMIC PERFORMANCE IN SCHOOL AND COLLEGE

Name of the exam	Type of the exam (100%)		Location of the institution (100%)		Average number of class hours required by the curriculum		Average result (out of 5)
	TVET	Non-TVET	Rural	Urban	Classroom	Lab/Workshop	
PSC	0	100	56.06	43.94	954.20	0.00	4.01
JSC or Equivalent	0	100	52.81	47.19	1123.05	3.67	3.86
SSC or Equivalent	35.79	64.21	43.29	56.71	1364.88	689.43	4.34
HSC or Equivalent	22.95	77.05	19.17	80.83	1615.42	1255.98	3.66
All cases	14.14	85.86	46.47	53.53	1214.66	538.41	4.04

SECTION C .7: National Skill Standard Basic (360-Hours) CURRICULUM

Duration of training	Number	%
1 month	0	0
2 months	9	6.16
3 months	5	3.42
4 months	8	5.48
5 months	0	0
6 months	124	84.93
All Cases	146	100

SECTION D: DEMAND OF JOBS

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average number of weeks/ months the students of this trade get the job	Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Three industries that most of the graduates of this trade work on		
	% of "Yes"	% of "No"					1	2	3
Apparel Merchandising	100.0	0.0%	1	15000	80	25000			
Auto mechanics	100.0	0.0%	3	15000	50	13000			
Computer operation/programming	96.3	3.7%	2	14289	42	14673			
Database programming	100.0	0.0%	2	17125	66	15563			
Dress making & Tailoring	100.0	0.0%	2	12333	70	10500			
Electrical House Wiring	87.5	12.5%	2	13067	77	13250			
Food & beverage production/Service	100.0	0.0%	2	10000	50	13500			
General Electrician	100.0	0.0%	3	15000	75	17500			
Graphics design & Multimedia programming	80.0	20.0%	2	12778	33	14500			
Hardware & Networking	100.0	0.0%	2	20000	90	30000			
Industrial Sewing Machine & Maintenance	0.0	100.0%							
Machinist	100.0	0.0%	2	8000	30	15000			
Maintenance of Electrical Equipment	100.0	0.0%	2	5000	37	12333			
Mobile phone servicing	100.0	0.0%	2	10000	70	15000			
Refrigeration & Air Conditioning	100.0	0.0%	2	9000	60	10500			
Tiles setting & Fitting	100.0	0.0%	1	15000	95	12000			
Welding & Fabrication	100.0	0.0%	1	17500	83	11000			
Other Trades	90.9	9.1%	2	12871	67	12633			

Three industries that most of the graduates of this trade work on

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program				
Type of course	Name of trade	Company-1	Company-2	Company-3
Diploma	Electrical	ccn political institute	basundhara group	geghana group
Diploma	Civil	sorwra builders	skytouch architec ltd	ccn politicnical institute
Diploma	others	meghla composit knit	dac group	
Diploma	others	noman group	snowtex outer well ltd	
Diploma	Fisheries	govt and private textile		
Diploma	Garments design & pattern making	garments	govt	walton
Diploma	Electrical	walton	bwsumeo	somsat group of ind
Diploma	Electrical	power section	graments center	other factory
Diploma	Mechanical	PDB, PGCB, BOP	Gas sector	railway
Diploma	Civil	D Q pof & tech	three sign industry	team builder
Diploma	Mechanical	thai bevarage	arafat builders limited	energypack
Diploma	Civil	cumilla ingeniaring planing consaltence	borishal jhorna nibash	toma ingeniaring farm
Diploma	Civil	marks builders,mirpur	shahidullah consattent	toma builders farm
Diploma	Electrical	energy pac	bsrm steel	srm steel
Diploma	Civil	cpdl	max constraction	mack constraction
Diploma	Civil	masiontech comonication	farid builders	abc builders
Diploma	Mechanical	abul khayer steel	KYCR	BRSM
Diploma	Automobile	hero honda motors	expect plastic	custom
Diploma	Marine	IMS	western marine	mercantile marine
Diploma	Electronics	oppo mobile company	symphony company	gazi group
Diploma	Electrical	BSL contraction limited bogura	ABC tiles bogura	
Diploma	Electronics	adison group company	vivo	oppo
Diploma	Mechanical	meghna group of company		
Diploma	Construction	IT sector	multinational company	
Diploma	Civil	private construction	real state	govt project like
Diploma	Electrical	industry / mill factory	real state	DESCO, pollibiddut,metro rail
Diploma	Pharmacy	central hospital	square hospital	labaid hospital
Diploma	others	bangladesh speashalist hospital	shoronika hospital	sirajul medical college hospital
Diploma	Pharmacy	lazzfarma limited	ibne sina	labaid

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program

Type of course	Name of trade	Company-1	Company-2	Company-3
Diploma	Pharmacy	popular famacitical	labaid	ibne sina
Diploma	Laboratory	labaid hospital dhaka	moon hospital	tower hospital
Diploma	Laboratory	sadia hospital	moon hospital	cb path
Diploma	Patient care	general hospital	private clinic	garments
Diploma	Laboratory	sorkari hospital	private clinic	
Diploma	Medical	al muslim	GK fashion	rabeya clinic
Diploma	others	clinic	diagonstic center	hospital
Diploma	Patient care	hospital	clinic	
Diploma	Chemical	garments	pran	akiz group
HSC (Voc)		walton		
HSC (Voc)		walton	variry garments	
HSC (Voc)		garments	textile	
HSC (Voc)		technical school	textile	garments
HSC (Voc)		ACImedicine company	jenith medicine company	polli biddut
HSC (Voc)		jubo unnoyoin	IT traning center	feni govt technical school & college
HSC (Voc)		apex garments		
SSC (Voc)		bexmico pharma		
SSC (Voc)		beximco pharma		
SSC (Voc)		grameen phone	nixon	
SSC (Voc)		gramin phine	nikson	
SSC (Voc)		betna	national electronics	
SSC (Voc)		national electronics	betni	
SSC (Voc)		pran	arecal	
SSC (Voc)		pran	RFL	
SSC (Voc)	Mechanical	police	school	NGO
SSC (Voc)	Electrical	NGO	school	administration
SSC (Voc)	Electronics	training center	NGO	school
SSCI (Voc)	Civil	sun place garments factory		
SSC (Voc)		walton		
SSC (Voc)		walton	sony	
SSC (Voc)		TMSS		
SSCI (Voc)		standard garments limited		
SSC (Voc)		standard garments limited		
SSC (Voc)	Electrical	pran	enginiar	
SSC (Voc)	Electronics	pran		
SSC (Voc)		navana	sharif melamain	
SSC (Voc)		navana	sharif melamain	
SSC (Voc)		joynal group		
SSC (Voc)		joynal group		
SSC (Voc)	Computer	duet		
SSC (Voc)	Electronics	pran	ksrm	habib bilders
SSC (Voc)	Computer	fresh company	bashundara group	ksrm steel

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program

Type of course	Name of trade	Company-1	Company-2	Company-3
SSC (Voc)	Computer	samid power	sas boro factory	fresh company
SSC (Voc)	Civil	anowar indestrial group	zahed iron	rema electronies
SSC (Voc)	Electrical	einza comany	four as group	sanzi textile
SSC (Voc)	Electronics	garments	walton	navana
SSC (Voc)		nasir glass	navana	comfort
SSC (Voc)		bivinno portishtan		
SSC (Voc)		bivinno protishtan		
SSC (Voc)		waltan	garments	
SSC (Voc)		walton	jomuna	garments
SSC (Voc)		self employed	garments	
SSC (Voc)		govt job	garments	ngo
SSC (Voc)	Computer	school	training ceter	polic
SSC (Voc)	Electronics			
SSC (Voc)	Computer	polic	school	training center
SSC (Voc)	Computer	walton		
SSC (Voc)	Civil	denis company	hakim group	school
SSC (Voc)	Electrical	training center	pran company	dano group
SSC (Voc)	Electronics	econo	ahad jute mill	akij factory
SSC (Voc)	Electronics	ahad jute mils	akij factory	econo
SSC (Voc)	Civil	shopping mall	super shop	garments
SSC (Voc)	Architecture	developer		
SSC (Voc)	Ceramics	dvelpoer		
SSC (Voc)		unilivar	maf shose	gps
SSC (Voc)		bsrm	uniliver	abdul khayer
SSC (Voc)		pran	kazi enter prise	mukit construction
SSC (Voc)		munayem constraction	bsrm	fahim constracion
SSC (Voc)		beximco	garments	walton
SSC (Voc)	Computer	garments	training center	beximco
SSC (Voc)		my one	green tech	local job
SSC (Voc)		bsrm	php grou[adision electronices
SSC (Voc)		bsrm	reckit and coolmen	pran rfl
SSC (Voc)	Jute	technical training center		
SSC (Voc)		garments	navana group	
Basic course	Graphics design & Multimedia programming	smart it tangail	walton	it solution
Basic course	Computer operation /programming	link three		
Basic course	Tiles setting & Fitting	kader enter prise	salman enterprise	kader engineering and construction
Basic course	Electrical House Wiring	construction	steel binding	mashion
Basic course	Refrigeration & Air Conditioning	TMSS technical	walton service center	rangs

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program

Type of course	Name of trade	Company-1	Company-2	Company-3
Basic course	Refrigeration & Air Conditioning	bangladesh korean training center	walton	marchel
Basic course	Electrical House Wiring	factory	pathology	
Basic course	Food & beverage production/Service	3 star,4 star,5 star hotel	restaurant	fast food shop
Basic course	Food & beverage production/Service	the westin dhaka	hansa a primium residence	lake shore
Basic course	Graphics design & Multimedia programming	IT institute	computer shop	
Basic course	Computer operation/programming	IT sector	e commerce	
Basic course	Other Trades	IT sector	private sector	
Basic course	Other Trades	private car driving	uber driving	driving in various company
Basic course	Electrical House Wiring	akiz group	electrician in mills and factories	
Basic course	Maintenance of Electrical Equipment	energy light	voltage rijer	solar pannel
Basic course	Mobile phone servicing	sondhani	grammen phone	vivo mobile
Basic course	Other Trades	local transport		
Basic course	Computer operation/programming	universal garments	ken park garments	young one limited
Basic course	Computer operation/programming	you one limited	universal garments	KSRM
Basic course	Electrical House Wiring	dexim expart	regency garments	pacific garments
Basic course	Other Trades	HKD garments	pacific garments	young one garments
Basic course	Dress making & Tailoring	salam garments	BS garments	genex textile
Basic course	Electrical House Wiring	AK Khan textile	salam garments	BS garments
Basic course	Graphics design & Multimedia programming	clipan group	chin chong shoes bd ltd	image setting
Basic course	Graphics design & Multimedia programming	sadi digital printing	sultania printing	eco digital pringing

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program

Type of course	Name of trade	Company-1	Company-2	Company-3
Basic course	Maintenance of Electrical Equipment	BSRM	BKTTC	chattagram fertilizer factory
Basic course	Maintenance of Electrical Equipment	BKTTC	pacific jeans	
Basic course	Data base programming	tower haspatal	comilla EPZ	robi telicom
Basic course	Computer operation/ programming	nahid mobile point	comilla high school	national hospital
Basic course	Computer operation/ programming	etanium computer technology	pepsi company	metro hospital
Basic course	Computer operation/ programming	pepsi company	meghna life ins	eianiam computer tech
Basic course	Computer operation/ programming	alfala bidida nikaton	burichang model academy	arak anandapur adarsho high school
Basic course	Computer operation/ programming	sonar bangla school	burichang adhonik hospital	soboj bangla school
Basic course	Computer operation/ programming	debidar digital computer & electronic	royel computer	rafi computer
Basic course	Computer operation/ programming	andikutu high school	patton high school	badughar madrasha
Basic course	Computer operation/ programming	royal hospital	pepsi company	meghna life insurance
Basic course	Computer operation/ programming	agrani bank	sonali bank	cumilla EPZ
Basic course	Computer operation/ programming	shohojogi company limited	KDS garments	NS garments
Basic course	Computer operation/ programming	zenex call center	KDS group	
Basic course	Other Trades	TMSS		
Basic course	Other Trades	computer training institute	NGO	
Basic course	Other Trades	TMSS	janata bank	agrani bank
Basic course	Other Trades	TMSS	agrani bank	
Basic course	Other Trades	global touch	info tech	
Basic course	Other Trades	bogura diebatics hospital	BM model school & college	independent school & college

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program

Type of course	Name of trade	Company-1	Company-2	Company-3
Basic course	Computer operation/ programming	tanjim it	shihab computer	smart it
Basic course	Computer operation/ programming	computer ingeniaring center	rangdhunu typing center	italy computer
Basic course	Electrical House Wiring	CCN polytechnic institute	magic paradise	rehabe constraction
Basic course	Electrical House Wiring	megic peradise	dianosar park	nilkunjo resort
Basic course	Computer operation/ programming	education of institute	govt job	walton
Basic course	Other Trades	garments	square	shahadat college
Basic course	Data base programming	IT solution	walton	
Basic course	Graphics design & Multimedia programming	ITTC		
Basic course	Computer operation/ programming	amana group	it training center	free lanching
Basic course	Computer operation/ programming	amana group		
Basic course	Data base programming	construction company	DBL group	montx group
Basic course	Data base programming	navana		
Basic course	Computer operation/ programming	training center	pran company	school
Basic course	Graphics design & Multimedia programming	nova electronics	training center	pran group
Basic course	Graphics design & Multimedia programming	srijon printer		
Basic course	Graphics design & Multimedia programming	srijoni printer		
Basic course	Computer operation/ programming	smart it	walton	it solution
Basic course	Machinist	pran company	training center	school
Basic course	Electrical House Wiring	standard group	ACI	dgkon

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program				
Type of course	Name of trade	Company-1	Company-2	Company-3
Basic course	Electrical House Wiring	rupper nuclear power plant	amana group	rajshahi training institute
Basic course	General Electrician	amana group	navana group	NGO
Basic course	Welding & Fabrication	walton	DTCL	navana group
Basic course	Welding & Fabrication	walton	DBL group	
Basic course	Other Trades	ahad jute mills	mesers hamid workshop	rifat workshop
Basic course	Computer operation/programming	training center	pran company	school
Basic course	Computer operation/programming	dano company	pran company	training center
Basic course	Computer operation/programming	election office	akiz group	
Basic course	Computer operation/programming	election commission	education institute	
Basic course	Computer operation/programming	school	training center	NGO
Basic course	Computer operation/programming	azad jute mills	elite computer limited	gazi iron store
Basic course	Computer operation/programming	econo	azad jute mills	it limited
Basic course	Computer operation/programming	ekota outsourcing		
Basic course	Computer operation/programming	brac	army	police
Basic course	Computer operation/programming			
Basic course	Computer operation/programming	technical training center	school	brac
Basic course	Computer operation/programming	aziz jute mills		
Basic course	Computer operation/programming	asia bank	brac	akiz factory
Basic course	Computer operation/programming	school	ngo	jute mills

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program

Type of course	Name of trade	Company-1	Company-2	Company-3
Basic course	Computer operation/ programming	ngo	school	training center
Basic course	Computer operation/ programming	press mills ltd		
Basic course	Computer operation/ programming	jute mills	training center	pran company
Basic course	Dress making & Tailoring			
Basic course	Other Trades	nrb global ltd		
Basic course	Other Trades	tarir boiler house	ara	tmss
Basic course	Other Trades	rent a car service		
Basic course	Other Trades	bandhon rent a car	sanowar enterprase	
Basic course	Other Trades	bangladesh army	grameen bekari	
Basic course	Data base programming	cybertec computer proschikon kendro	brac	brac bank
Basic course	Other Trades	cantorment public school and college	daily korotoya	dc office
Basic course	Other Trades	mondol group		
Basic course	Other Trades	mondol group		
Basic course	Computer operation/ programming	sony		
Basic course	Computer operation/ programming	pran		
Basic course	General Electrician	pertex group	fakir group	
Basic course	Electrical House Wiring	megna group	shah cement group	
Basic course	Computer operation/ programming	sina group	meghna group	
Basic course	Computer operation/ programming	md		
Basic course	Computer operation/ programming	fermacy		
Basic course	Computer operation/ programming	govt. hospital		
Basic course	Electrical House Wiring	munna food		

Table-2.6: Distribution of three industries that most of the graduates work on by trade & TVET program				
Type of course	Name of trade	Company-1	Company-2	Company-3
Basic course	Electrical House Wiring	arc enterprice		
Basic course	Apparel Merchandising	liton consal	msa group	
Basic course	Other Trades	fakir group	net	msa group
Basic course	Electrical House Wiring	dbl		
Basic course	Electrical House Wiring	md		
Basic course	Computer operation/ programming	pran rfl		
Basic course	Dress making & Tailoring	dew factory	new facion wear ltd	nisami garments
Basic course	Dress making & Tailoring	anika garments	nisami garments	muna factory
Basic course	Other Trades	aci company ltd		
Basic course	Other Trades	aci company ltd		
Basic course	Other Trades	shajajil hospital ltd		
Basic course	Other Trades	beshtrij ltd		
Basic course	Other Trades	uttarbasa eng. inst		
Basic course	Other Trades	dc office		
Basic course	Other Trades	bindu academy		
Basic course	Other Trades	bata company	win agroo	
Basic course	Other Trades	cybertech computer isnt.		
Basic course	Graphics design & Multimedia programming			
Basic course	Other Trades	turag garments	ahmmed uddin school	computer point
Basic course	Hardware & Networking	gano unnoyan center	jum bangladesh	khan printing and press

SECTION D: DEMAND OF JOBS –Diploma

Table-2.7: Distribution of the Diploma graduates by their trade & their perceptions of demand of jobs for a given trade

Trades of the Diploma TVET graduates	Students of this trade get job immediately after graduation		Average amount of salary of those who got the job	Average expected salary of the first job	Percentage of peer students who got a job	Average number of weeks the students of this trade get the job
	% of "Yes"	% of "No"				
Aircraft Maintenance (Avionics)	25.0	75.0%	10000	20000	100.0%	50
Architecture	33.3	66.7%	6000	5500	0.0%	30
Automobile	25.0	75.0%	16500	15000	0.0%	5
Ceramics	100.0	0.0%	12000	10000	100.0%	2
Chemical	100.0	0.0%	27500	12500	100.0%	15
Civil	100.0	0.0%	20900	14400	30.0%	59
Computer	75.0	25.0%	13333	15000	16.7%	37
Construction	50.0	50.0%	12000	9000	100.0%	40
Electrical	69.2	30.8%	12100	17110	40.0%	65
Electronics	100.0	0.0%	11375	14500	37.5%	50
Environmental, Instrumentation & process Control	100.0	0.0%	12500	17500	50.0%	39
Fisheries	100.0	0.0%	20000	12000	0.0%	40
Food	50.0	50.0%	15000	12000	0.0%	25
Garments design & pattern making	100.0	0.0%	15000	15000	0.0%	80
Jute	100.0	0.0%	20000	15000	0.0%	20
Laboratory	100.0	0.0%	12667	12333	66.7%	87
Marine	100.0	0.0%	15000	17000	100.0%	80
Mechanical	100.0	0.0%	14200	17600	80.0%	71
Mechatronics	0.0	0.0%			0.0%	
Medical	100.0	0.0%	12000	11500	0.0%	83
Mining & Mine survey	0.0	0.0%			0.0%	
Patient care	100.0	0.0%	13000	10000	100.0%	78
Pharmacy	100.0	0.0%	10333	12000	33.3%	77
others	83.3	16.7%	13300	13000	40.0%	74

SECTION D: DEMAND OF JOBS –HSC

Table-2.8: Distribution of the HSC (Voc)/BM graduates by their trade & their perceptions of demand of jobs

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average amount of salary of those who got the job	Average expected salary of the first job	Percentage of peer students who got a job	Average number of weeks the students of this trade get the job
	% of "Yes"	% of "No"				
Automobile	100.0%	0.0%	14000	15000	0.0%	50
Computer Operation & Maintenance	100.0%	0.0%	8000	10000	100.0%	40
Electrical Works & Maintenance	100.0%	0.0%	7733	9500	33.3%	87
Electronic Control & Communication	100.0%	0.0%	10000	8000	0.0%	10

SECTION D: DEMAND OF JOBS -SSC

Table-2.9: Distribution of the SSC/Dakhil (Voc) graduates by their trade & their perceptions of demand of jobs

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average amount of salary of those who got the job	Average expected salary of the first job	Percentage of peer students who got a job	Average number of weeks the students of this trade get the job
	% of "Yes"	% of "No"				
Architectural Drafting with CAD	33.3%	66.7%	15000	10000	100.0%	20
Automotive	40.0%	60.0%	12500	16000	50.0%	53
Building Maintenance	54.5%	45.5%	13143	12250	50.0%	33
Civil Construction	100.0%	0.0%	12667	12667	50.0%	24
Civil Drafting with CAD	100.0%	0.0%	14000	11500	100.0%	2
Computer & Information Technology	83.9%	16.1%	14808	18269	38.5%	33
Dress Making	62.5%	37.5%	13167	8600	40.0%	30
Electrical Maintenance Works	100.0%	0.0%	9000	9000	50.0%	15
Food Processing & Preservation	50.0%	50.0%	15000	12000	0.0%	25

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average amount of salary of those who got the job	Average expected salary of the first job	Percentage of peer students who got a job	Average number of weeks the students of this trade get the job
	% of "Yes"	% of "No"				
General Electrical Works	92.0%	8.0%	13708	19042	31.8%	29
General Electronics	66.7%	33.3%	13333	13404	23.1%	38
General Mechanics	93.8%	6.3%	11500	15313	46.7%	30
Poultry Rearing & Farming	100.0%	0.0%	18333	13333	0.0%	13

SECTION D: DEMAND OF JOBS -NSSB

Trades of the NSS Basic TVET graduates	Students of this trade get job immediately after graduation		Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Average number of weeks the students of this trade get the job
	% of "Yes"	% of "No"				
Apparel Merchandising	100.0	0.0%	15000	100.0%	25000	80
Auto mechanics	100.0	0.0%	15000	0.0%	13000	50
Computer operation/programming	96.2	3.8%	14373	22.0%	18314	42
Data base programming	100.0	0.0%	17125	37.5%	15563	66
Dress making & Tailoring	100.0	0.0%	12333	16.7%	10500	70
Electrical House Wiring	93.8	6.3%	12875	37.5%	13033	724
Food & beverage production/Service	100.0	0.0%	10000	50.0%	13500	50
General Electrician	100.0	0.0%	15000	50.0%	17500	75
Graphics design & Multimedia programming	80.0	20.0%	12778	25.0%	14500	33
Hardware & Networking	100.0	0.0%	20000	0.0%	30000	90
Machinist	100.0	0.0%	8000	0.0%	15000	30
Maintenance of Electrical Equipment	100.0	0.0%	5000	0.0%	12333	37
Masonry & rod binding	0.0	0.0%		0.0%		
Mobile phone servicing	100.0	0.0%	10000	0.0%	15000	70
Refrigeration & Air Conditioning	100.0	0.0%	9000	0.0%	10500	60
Tiles setting & Fitting	100.0	0.0%	15000	100.0%	12000	95

Trades of the NSS Basic TVET graduates	Students of this trade get job immediately after graduation		Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Average number of weeks the students of this trade get the job
	% of "Yes"	% of "No"				
Welding & Fabrication	100.0	0.0%	17500	100.0%	11000	83
Other Trades	88.6	11.4%	12781	28.1%	17161	67

SECTION: E REASONS FOR CHOOSING TVET

Reasons for taking up technical and vocational training	"Yes" Cases		"No" Cases	
	Number of graduates	%	Number of graduates	%
Advice from parents/ relatives	230	70.99	94	29.01
I had a strong interest in TVET	271	83.64	53	16.36
TVET graduates have better career growth	254	78.40	70	21.60
TVET graduates have good business opportunities	171	52.78	153	47.22
Free course was available	58	17.90	266	82.10
Affordable for the family	150	46.30	174	53.70
Took up TVET without any idea	81	25.00	243	75.00
TVET institute was near my place	105	32.41	219	67.59
I was inspired by past TVET graduates	134	41.36	190	58.64
I had no other option	15	4.63	309	95.37
Reputation of the institution	250	77.16	74	22.84
All Cases				

SECTION F – RATE YOUR TEACHERS

How do you rate the proficiency of your teachers in teaching?	Scale of 1 to 10
Rating of the teachers by the graduates	
	Average
The teachers were well versed about theoretical aspects of the subjects taught	7.86
The teachers were well versed about practical aspects of the subjects taught	7.83
Teachers were academically and professionally qualified to teach	7.74
Generally the syllabuses were fully covered	8.58
The teachers were organized and prepared for every class.	7.73
The teachers explained the material clearly and in ways that are easy to understand, offered alternative explanations or additional examples, and cleared up confusion.	7.90
The teachers were apt at taking practical classes and good at demonstrating the usage of various lab	7.77
Teachers were punctual and utilized the class-time properly	7.79
The teachers encouraged creativity in the class works and assignments	7.70

SECTION G–CURRENT STATUS/ACTIVITIES OF THE GRADUATE

Current status/activity of the TVET graduates	Diploma		HSC (Voc.)		SSC/Dakhil (Voc.)		NSS Basic		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
Wage employed	33	75.00	6	75.00	10	7.94	65	44.52	114	35.19
Self-employed	1	2.27	2	25.00	10	7.94	14	9.59	27	8.33
Not working but have found a job waiting to start	0	0	0	0	1	0.79	0	0	1	0.31
Not working but looking for work	3	6.82	0	0	0	0	12	8.22	15	4.63
Total Labour force	37	84.09	8	100.0	21	16.67	91	62.33	157	48.46
Not working and unavailable for work and not looking for a job	0	0	0	0	0	0	3	2.05	3	0.93
Studying full-time and not working	6	13.64	0	0	99	78.57	43	29.45	148	45.68
Studying full-time and working part-time	1	2.27	0	0	6	4.76	4	2.74	11	3.4
Full-time household work	0	0	0	0	0	0	2	1.37	2	0.62
Others	0	0	0	0	0	0	3	2.05	3	0.93
All Cases	44	100	8	100	126	100	146	100	324	100

Skills Mismatch

Trades of employed graduates	Wage employed	Self-employed	Current job title
Diploma trades:	33	1	
Civil	2		Trade inspector
Civil	3		Assistant Engineer
Civil	1		Assistant Teacher
Civil	1		Office Sahokary
Laboratory medicine	1		Technologist
Nursing	1		Senior Nurse
Electrical	1		Upa Sahokari Engineer
Electrical	2		Trade inspector
Electrical	1		Assistant Engineer
Electrical	1		Assistant Manager
Electronics	2		Trade inspector
Garments design and pattern making	1		Office Sahokary

Table-2.13A: Distribution of employed graduates by trades of training and current job title			
Trades of employed graduates	Wage employed	Self-employed	Current job title
Graphics design		1	Owner
Laboratory	3		Lab Sahokari
Marine	1		Trade inspector
Mechanical	1		Trade inspector
Mechanical	1		Assistant Engineer
Mechanical	1		Assistant Teacher
Medical	1		Medical Assistant
Medical	1		Assistant Doctor
Nursing	2		Senior Nurse
Pharmacy	2		Owner
Pharmacy	1		Office Sahokary
Textile	2		Assistant Engineer
HSC (Voc) trades	6	2	
Automobile	1		Office Sahokary
Computer operation & maintenance	1		Trade inspector
Electrical works & maintenance	1		Owner
Electrical works & maintenance	1		Electrician
Electrical works & maintenance	1		Assistant Teacher
Electronic control & communication	1		Owner
Computer operation		1	Owner
Dress Making		1	Owner
SSC/Dakhil (Voc) trades	10	10	
Civil Construction	1		Operator
Computer & information technology	1		Electrician
Computer & information technology	2		Office Sahokary
Computer & information technology	1		Designer
Dress making	1		Operator
General electrical works	3		Office Sahokary
General electronics	1		Manager
Building maintenance		1	Owner
Civil drafting with CAD		1	Owner
Computer & information technology		1	Office Sahokary
Dress Making		1	Owner
General electrical works		1	Owner
General electrical works		1	Helper
General electrical works		1	Electrician
General electronics		1	Owner
General mechanics		2	Owner
NSS Basic trades	65	14	
Architectural drafting with CAD	1		Operator
Apparel merchandizing	1		Assistant Electrician
Computer office application	1		Linkman
Basic design and animation	1		Linkman
Computer operation	2		Operator
Computer application	1		Operator
Database programming	1		Office Sahokary

Table-2.13A: Distribution of employed graduates by trades of training and current job title			
Trades of employed graduates	Wage employed	Self-employed	Current job title
Graphic design & multimedia	1		Assistant Teacher
Computer office application	4		Trade inspector
Computer office application	6		Operator
Computer office application	1		Assistant Engineer
Computer office application	1		Assistant Teacher
Computer operation	1		Trade inspector
Computer operation	2		Operator
Computer operation	3		Assistant Teacher
Computer operation	1		Owner
Computer operation	1		Seller
Database programming	1		Seller
Database programming	2		Trade inspector
Database programming	1		Operator
Database programming	1		Office Sahokary
Dress making & tailoring	2		Operator
Driving	1		Owner
Driving	1		Chemical man
Driving & auto mechanics	1		Owner
Electrical	3		Electrician
Electrical	1		Trade inspector
Electrical	4		Assistant Electrician
Electrical house wiring	2		Electrician
Electrical house wiring	1		Assistant Electrician
Food production	1		Chemical man
Food & beverage service	1		Boy
General electrician	1		Office Sahokary
Graphics design	1		Linkman
Graphics design	1		Manager
Graphics design	1		Office Sahokary
Maintenance of electrical equip.	1		Assistant Engineer
Maintenance of electrical equip.	1		Operator
Motor driving with basic maintenance	1		Driver
Refrigeration & air conditioning	2		Trade inspector
Sewing machine operation	1		Operator
Tiles and marble works	1		Tiles mistry
Wedding & fabrication	2		Day labor
Block, batik & printing		1	Owner
Database programming		1	Owner
Computer office application		3	Owner
Computer Operation		1	Technician
Database management		1	Operator
Dress making		1	Owner
Dress making & tailoring		1	Owner
Electrical house wiring		1	Owner
Graphic design		1	Owner
Mobile phone servicing		1	Owner

Trades of employed graduates	Wage employed	Self-employed	Current job title
Motor driving		1	Driver
Sewing machine operator		1	Owner

Unemployed graduates by duration of unemployment

Duration of unemployment of the unemployed graduates	Total	
	Number	%
3-4 weeks	11	22.92
1-3 months	18	37.50
4-6 months	10	20.83
7-12 months	3	6.25
13-18 months	0	0
More than 18 months	6	12.50
All Cases	48	100.0

Distribution of the unemployed graduates by trade and duration of unemployment – Diploma

Name of Diploma trades	Duration of unemployment													
	3-4 week		1-3 months		4-6 months		7-12 months		13-18 months		More than 18 months		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Automobile	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	1	100.0
Chemical	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0
Computer	0	0.0%	1	50.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0
Construction	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0
Laboratory	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0
Marine	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0
Mechanical	0	0.0%	1	50.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0
Medical	1	50.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0
Patient care	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0
All trades	2		4		5						1		12	

Distribution of the unemployed graduates by trade and duration of unemployment – NSSB

Name of NSS trades	Duration of unemployment													
	3-4 week		1-3 months		4-6 months		7-12 months		13-18 months		More than 18 months		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No.	%
Apparel Merchandising	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0
Auto mechanics	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	1	100.0
Computer operation/ programming	1	16.7%	2	33.3%	3	50.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0
Database programming	1	33.3%	1	33.3%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	3	100.0

Table-2.16: Distribution of the unemployed graduates by trade and duration of unemployment

Name of NSS trades	Duration of unemployment													
	3-4 week		1-3 months		4-6 months		7-12 months		13-18 months		More than 18 months		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No.	%
Dress making & Tailoring	0	0.0%	2	66.7%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	3	100.0
Electrical House Wiring	3	50.0%	2	33.3%	1	16.7%	0	0.0%	0	0.0%	0	0.0%	6	100.0
General Electrician	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0
Graphics design & Multimedia programming	1	50.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0
Hardware & Networking	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	1	100.0
Tiles setting & Fitting	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0
Other Trades	1	9.1%	5	45.5%	1	9.1%	1	9.1%	0	0.0%	3	27.3%	11	100.0
All trades	9		14		5		3				5		36	

SECTION-G.2: JOB HISTORY [For those who answered 1, 2 in G 1.1]

Table-2.17: Distribution of wage employed graduates by job history

Job history	Job/ Occupation	Average time period (Months)	% of permanent & temporary		% of full-time & part-time		% by type of contract		Average monthly income (Taka)
			Permanent	Temporary	Full time	Part time	Formal	Informal	
Current job	Tailoring	25	69.2	30.8	58.3	41.7	45.5	54.5	8923
	Driver	22	60.0	40.0	60.0	40.0	20.0	80.0	12200
	Private job	21	75.0	25.0	83.6	16.4	48.2	51.8	12986
	Govt. job	25	50.0	50.0	100.0	0.0	50.0	50.0	16225
	Teacher	23	53.8	46.2	84.6	15.4	69.2	30.8	14654
	Trainer	18	88.9	11.1	100.0	0.0	50.0	50.0	14056
	Product Supervision	11	100.0	0.0	100.0	0.0	100.0	0.0	14257
	Supervisor	9	50.0	50.0	100.0	0.0	100.0	0.0	11000
	Cook	15	0.0	100.0	0.0	100.0	0.0	100.0	4000
	Other		100.0	0.0	100.0	0.0	0.0	100.0	25000
	Business	19	45.5	54.5	54.5	45.5	0.0	100.0	9792
	Electrical house wiring	23	25.0	75.0	50.0	50.0	50.0	50.0	10425
	Needle works	26	100.0	0.0	0.0	100.0	0.0	100.0	3000
	Management	26	66.7	33.3	100.0	0.0	66.7	33.3	21000
	Machineries maintenance	49	100.0	0.0	100.0	0.0	50.0	50.0	14000
	Data processing	26	60.0	40.0	80.0	20.0	60.0	40.0	12400
Contractor	25	50.0	50.0	100.0	0.0	25.0	75.0	17250	
Graphics designer	7	0.0	100.0	0.0	100.0	0.0	100.0	4000	

Job history	Job/ Occupation	Average time period (Months)	% of permanent & temporary		% of full-time & part-time		% by type of contract		Average monthly income (Taka)
			Permanent	Temporary	Full time	Part time	Formal	Informal	
	Machine Operator	29	66.7	33.3	66.7	33.3	0.0	100.0	13653
	Farmer	24	0.0	100.0	0.0	100.0	0.0	100.0	4000
	Imamoti	45	0.0	100.0	100.0	0.0	0.0	100.0	4200
	Chemist	28	100.0	0.0	100.0	0.0	100.0	0.0	11500
	Nursing	37	100.0	0.0	100.0	0.0	100.0	0.0	11000
	Computer technician	15	100.0	0.0	100.0	0.0	100.0	0.0	20000
	Electrical technician	25	100.0	0.0	100.0	0.0	100.0	0.0	9500
Last job-1	Private job	13	50.0	50.0	75.0	25.0	25.0	75.0	11375
	Govt. job	70	50.0	50.0	50.0	50.0	50.0	50.0	8000
	Trainer	23	0.0	100.0	100.0	0.0	0.0	100.0	2000
	Supervisor	7	50.0	50.0	50.0	50.0	100.0	0.0	13500
	Business	9	100.0	0.0	100.0	0.0	100.0	0.0	5000
	Contractor	14	100.0	0.0	100.0	0.0	100.0	0.0	16000
	Soil tester	18	100.0	0.0	100.0	0.0	100.0	0.0	10000

Media used for job searching for current jobs, last job1, last job2 & last job3

Media used for job search	Public graduates		NGO graduates		Private graduates		Total graduates	
	Number	%	Number	%	Number	%	Number	%
TVET Institution							59	37.34
Newspaper							6	3.8
Internet posting							8	5.06
Friends & Relatives							72	45.57
Others (specify e.g. job fairs)							13	8.23
All Cases							158	100

SECTION- H.1: GRADUATE'S JOB SATISFACTION [For those who answered 1, 2 in G 1.1]

Level of satisfaction (on a scale of 1 to 4)	Not satisfied		Partly satisfied		Mostly satisfied		Fully Satisfied		Average score mean
	1		2		3		4		
	Number	%	Number	%	Number	%	Number	%	
Wage employed graduates(108)	2	1.85	23	21.30	44	40.74	39	36.11	3.11
Self-employed graduates (27)	2	7.41	3	11.11	13	48.15	9	33.33	3.07
All employed graduates	4		26		57		48		3.10

Distribution of the wage employed graduates by the reasons for job satisfaction.

Reasons for job satisfaction	Strongly disagree		Slightly disagree		Neutral		Slightly agree		Strongly agree	
	Number	%	Number	%	Number	%	Number	%	Number	%
I feel I am paid adequately for the work I do	11	6.29	30	17.14	13	7.43	50	28.57	25	14.29
I am satisfied with my job prospect/ promotion/ salary increase	11	6.32	36	20.69	22	12.64	40	22.99	18	10.34
My supervisor/boss is knowledgeable about my work	5	2.87	2	1.15	7	4.02	17	9.77	94	54.02
I am satisfied with my workplace safety / workplace environment	5	2.81	3	1.69	14	7.87	39	21.91	79	44.38
The benefits we receive are as good as most other firms offer (4	2.29	20	11.43	27	15.43	52	29.71	25	14.29
My employers offer me training opportunities	18	10.34	35	20.11	24	13.79	19	10.92	29	16.67
My employers care for my career advancement	15	8.62	29	16.67	26	14.94	37	21.26	19	10.92
My work assignments are fully explained (ToR is followed)	11	6.32	12	6.90	27	15.52	41	23.56	34	19.54
My relationship with my colleagues is congenial	6	3.43	3	1.71	4	2.29	16	9.14	102	58.29
There are rewards/ appreciation for hard working	12	6.94	23	13.29	26	15.03	29	16.76	34	19.65

SECTION I.1 SELF ASSESSED SKILL

Indicators of skill/proficiency	Total number of wage employed graduates reporting	Number of wage employed graduates reporting 1	Number of wage employed graduates reporting 10	On a scale of 1 to 10
				Average score of all wage employed graduates
How do you assess your level of proficiency in performing your job? (1= No Proficiency, 10= Highly Proficient)	286	2	4	7.40
How do you think your TVET helps to perform your work proficiently? (1= Not at all, 10= Fully)	286	3	8	7.39
How do you assess the current market demand of your skill that you have attained from TVET? (1= No demand, 10= High demand)	300	0	9	7.45
How do you assess the market demand of your skill in the next that you have attained from TVET? (1= No demand, 10= High demand)	300	0	14	7.47
With the skill you have attained If you want to leave this job now how difficult will it be to find a similar/ better job? (1= No difficulties, 10= Very difficult)	195	20	2	5.14

3. TVET Students

SECTION: C.1: LEVEL OF EDUCATION

TVET Programs	Total	
	Number	%
Diploma	41	12.65
HSC (Vocational)	7	2.16
SSC/Dakhil (Vocational)	128	39.51
NSS Basic Course	148	45.68
All Programs	324	100

SECTION C.2: DIPLOMA- CURRICULUM

TVET program	TVET trade	Total	
		Number	%
Diploma	Architecture	2	4.9%
	Automobile	2	4.9%
	Civil	4	9.8%
	Computer	5	12.2%
	Electrical	7	17.1%
	Electronics	1	2.4%
	Laboratory	2	4.9%
	Mechanical	2	4.9%
	Medical	2	4.9%
	Patient care	2	4.9%
	Pharmacy	1	2.4%
	Power	1	2.4%
	Printing & graphics design	1	2.4%
	Others	9	22.0%
HSC(Vocational/BM)	Electrical	1	100.0%
SSC(vocational)	Others	0	0.0%
Basic course	Others	0	0.0%

SECTION C.3: EDUCATION EXPENDITURE-DIPLOMA

Heads of education expenditure	Average expenditure per student			Total
	Diploma		HSC(Vocational/BM)	
Yearly registration fee	3112		1000	3062
Monthly fee	1648		5000	1727
Yearly lab fee	2315		2000	2308
Exam fee (per semester)	2554		1100	2519
Expense of the entire program (on average)	300231		200000	297844
Total	3112		1000	3062

Coaching center/ private tutor

Table-3.4: Percentage distribution of Diploma students by incidence of coaching/private tutoring & by type of institution								
Incidence of coaching/private tuition	Diploma		HSC(Vocational/BM)		SSC(vocational)		Basic course	
	% of students with "Yes" cases	% of students with "No" cases	% of students with "Yes" cases	% of students with "No" cases	% of students with "Yes" cases	% of students with "No" cases	% of students with "Yes" cases	% of students with "No" cases
Do you go to any coaching center?/ Do you have any private tutor?	2.44	97.56	0	100	0	0	0	0

SECTION D.2: EDUCATION EXPENDITURE-HSC (Voc.)/BM

Table-3.5: Average education expenditure of HSC (Voc) students (In Taka)	
Heads of education expenditure	Average expenditure per student
Yearly registration fee	1055
Monthly fee	28.33
Yearly lab fee	475
Exam fee (per semester)	255
Expense of the entire program (on average)	90833.33
Total	

SECTION E.2: EDUCATION EXPENDITURE-SSC/Dakhil (Voc.)

Table-3.6: Average education expenditure of SSC/Dakhil (Voc) students by type of institution (In Taka)			
Heads of education expenditure	Average expenditure per student		
	Public institutions	Private institutions	NGO
Yearly registration fee	910.22	657.13	250
Monthly fee	47.11	344.72	6400
Yearly lab fee	473	743.30	550
Exam fee (per semester)	364.89	546.85	382.5
Expense of the entire program (on average)	47.966.66	45454	41250
Total			

SECTION H .1: National Skill Standard Basic (360-Hours) CURRICULUM

Table-3.7: Distribution of NSS Basic Course students by duration of training		
Duration of training	Number	%
< 1 week		
1-2 weeks		
3-4 weeks		
1-3 months	11	7.53
4-6 months	69	47.26
>6 months	66	46.21
All Cases	146	100

EDUCATION EXPENDITURE- National Skill Standard Basic (360-Hours) COURSES

Heads of education expenditure	Total
Yearly registration fee	2127.13
Monthly fee	
Yearly lab fee	1466.47
Exam fee (per semester)	361.05
Expense of the entire program (on average)	15623.4
Total	

SECTION I: JOB EXPECTATIONS

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Average number of weeks the students of this trade get the job
	% of "Yes"	% of "No"				
Architecture	100.0%	0.0%	12500	100.0%	13500	50
Automobile	100.0%	0.0%	10000	50.0%	13000	58
Civil	75.0%	25.0%	14000	33.3%	15333	70
Computer	100.0%	0.0%	16100	80.0%	16000	65
Electrical	100.0%	0.0%	12625	62.5%	14125	65
Electronics	100.0%	0.0%	18000	100.0%	12000	90
Laboratory	100.0%	0.0%	12500	0.0%	13500	75
Mechanical	100.0%	0.0%	13750	0.0%	15000	60
Medical	100.0%	0.0%	13500	50.0%	16500	85
Patient care	100.0%	0.0%	9000	100.0%	10000	68
Pharmacy	100.0%	0.0%	11000	100.0%	12000	60
Power	100.0%	0.0%	12000	0.0%	15000	20
Printing & graphics design	100.0%	0.0%	15000	100.0%	12000	95
others	100.0%	0.0%	9667	44.4%	11111	63

Distribution of TVET students by perceptions of job expectations – HSC (Voc)

Table-3.10 : Distribution of the HSC (Voc) students by their trade & their perceptions of job expectations

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Average number of weeks/months the students of this trade get the job
	% of "Yes"	% of "No"				
Clothing & Garments Finishing	100.0%	0.0%	5000	100.0%	8000	10
Computer Operation & Maintenance	100.0%	0.0%	10000	0.0%	17500	28
Electrical Works & Maintenance	100.0%	0.0%	15000	0.0%	12500	10
Electronic Control & Communication	100.0%	0.0%	18000	0.0%	13000	80
Refrigeration & Air Conditioning	100.0%	0.0%	15000	100.0%	15000	5

Distribution of TVET students by perceptions of job expectations – SSC (Voc)

Table-3.11: Distribution of the SSC/Dakhil (Voc) students by their trade & their perceptions of job expectations

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Average number of months the students of this trade get the job
	% of "Yes"	% of "No"				
Agro-based Food	100.0%	0.0%	13750	0.0%	13500	4
Automotive	80.0%	20.0%	17750	0.0%	18500	4
Building Maintenance	75.0%	25.0%	10571	16.7%	17167	3
Civil Construction	80.0%	20.0%	12200	25.0%	11600	1
Computer & Information Technology	83.3%	16.7%	15500	25.0%	14350	3
Dress Making	42.9%	57.1%	13500	33.3%	13667	3
Electrical Maintenance Works	100.0%	0.0%	10000	0.0%	12000	5

Table-3.11: Distribution of the SSC/Dakhil (Voc) students by their trade & their perceptions of job expectations

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Average number of months the students of this trade get the job
	% of "Yes"	% of "No"				
Food Processing & Preservation	75.0%	25.0%	8333	33.3%	15833	3
General Electrical Works	86.1%	13.9%	14030	22.6%	14500	3
General Electronics	92.9%	7.1%	10923	15.4%	13923	2
General Mechanics	81.8%	18.2%	14533	11.1%	15222	4
Machine Tools Operation	100.0%	0.0%	8000	0.0%	10000	4
Patient Care Technique	100.0%	0.0%	10000	100.0%	10000	2
Poultry Rearing & Farming	100.0%	0.0%	16000	100.0%	8000	4

SECTION I: JOB EXPECTATIONS NSS Basic Students

Table-3.12: Distribution of the NSSB Course students by their trade & their perceptions of job expectations

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Average number of months the students of this trade get the job
	% of "Yes"	% of "No"				
Arc & gas Welding	100.0	0.0	9000	100.0	8000	3
Auto mechanics	100.0	0.0	10000	0.0	15000	5
Computer operation/ programming	98.3	1.7	12690	46.6	14053	2
Database programming	100.0	0.0	15000	44.4	16222	4
Dress making & Tailoring	100.0	0.0	15000	33.3	10667	6
Electrical House Wiring	91.7	8.3	15273	9.1	18409	1
Food & beverage production/Service	0.0	100.0	8000	0.0	12000	7
General Electrician	100.0	0.0	13600	20.0	11125	1.5
Graphics design & Multimedia programming	100.0	0.0	14571	28.6	10714	4
Hardware & Networking	0.0	100.0	15000	0.0	20000	3
Housekeeping	100.0	0.0	11000	50.0	15000	8
Maintenance of Electrical Equipment	100.0	0.0	8000	100.0	10000	5
Masonry & rod binding	100.0	0.0	10000	0.0	10000	2

Trades of the TVET graduates	Students of this trade get job immediately after graduation		Average expected salary of the first job	Percentage of peer students who got a job	Average amount of salary of those who got the job	Average number of months the students of this trade get the job
Mobile phone servicing	100.0	0.0	5000	0.0	12000	3
Plumbing & pipe fitting	100.0	0.0	12000	100.0	10000	4
Refrigeration & Air Conditioning	100.0	0.0	18000	50.0	12000	3
Tiles setting & Fitting	100.0	0.0	15000	0.0	15000	6
Welding 4G	100.0	0.0	11500	50.0	8750	5
Other Trades	100.0	0.0	12206	41.2	12868	7

Distribution of three companies most of the industries work on

Course Type	Name of trade	Company-1	Company-2	Company-3
Diploma	Computer	pubali bank	sonali bank	pri teacher training college
Diploma	Computer	creative it center	ait	meghna gruop
Diploma	others	meghna compojit net		
Diploma	others	megla composite net	dak group	
Diploma	others	fashion dresinging	chain shep	garments
Diploma	others	garments factory	buying hosue	fashion design
Diploma	Electrical	pdb	nesco	desco
Diploma	Electrical	power company dpdc	besco	pdb
Diploma	Mechanical	pdb	p & H	WDB
Diploma	Electrical	bashundhara	rfl	meghna
Diploma	Electrical	bashundhara	meghna	epz cumilla
Diploma	Automobile	telmo motors	shujogi motors	navana
Diploma	Mechanical	bsrm	gps espat	ksrm
Diploma	Power	navana	rangs	akij
Diploma	Electrical	power greed com	nesco company	ston baied company
Diploma	Architecture	equity company	senmar	cpdl
Diploma	Architecture	cpdl	sanmar	epic
Diploma	Civil	vikiuv soft and tec	arafat bilders	enagi pac
Diploma	Electrical	electro energy pac	afat bilders	bi cube and saft
Diploma	Electronics	walton	lg	pran
Diploma	Computer	walton	pran	
Diploma	Civil	dph	bdc	
Diploma	Computer	pwd	tmss	
Diploma	Computer	tmss	islami bank bangladesh ltd	new harijon
Diploma	Civil	tmss		
Diploma	Electrical	training center	mettorel	desco
Diploma	Printing & graphics design	it sector	multi national company	free training
Diploma	Automobile	uttara motors	honda motors	navana motors
Diploma	others	bangladesh medical college	almanar hospital	

Table-3.13: Distribution of three companies most of the industries work on by trade & TVET program

Course Type	Name of trade	Company-1	Company-2	Company-3
Diploma	Pharmacy	brb hospital	green central hospital	japan bangladesh freindship hos.
Diploma	others	united genarel hospital		
Diploma	others	provati clinic bagura		
Diploma	Laboratory	moon hospital	navana hospital	square hospital
Diploma	Patient care	comfort hospital	moon hospital	rayel hospital
Diploma	Laboratory	privet clinic		
Diploma	others	sonar bangla hospital	privet clinic	daigonostic center
Diploma	Patient care	hospital	clinic	
Diploma	others	trauma center	mirpur digonistic center	
Diploma	Medical	al muslim	super medical	rabeya clinic
Diploma	Medical	al muslim garments	dhaka epz	gk garments
Diploma	Electrical	besco	desco	dpdc
HSC (Voc)	Clothing & Garments Finishing	walton	private ttc	self employed
HSC (Voc)	Computer Operation & Maintenance	overseage job	walton	govt job
HSC (Voc)	Electrical Works & Maintenance	school	walton	aborti color textiles
HSC (Voc)	Refrigeration	jamuna fridge		walton
SSC (Voc)	Automotive	rfl company		jamuna gas company ltd
SSC (Voc)	Building Maintenance	rfl company		
SSC (Voc)	Civil Construction	apex garments		
SSC (Voc)	Computer & Information Technology	aci company		global farma ltd
SSC (Voc)	Dress Making	training institute	walton	garments
SSC (Voc)	Electrical Maintenance Works	training institute		garments
SSC (Voc)	Food Processing & Preservation	navana group	garments	walton
SSC (Voc)	General Electrical Works	garments		walton
SSC (Voc)	General Electronics	can mark graphies	al amin it sector	royal computer
SSC (Voc)	General Mechanics	comilla computer it center	programing hero	aziz it center
SSC (Voc)	Machine Tools Operation	fouzia textile	ksrm	cumilla it center
SSC (Voc)	General Electrical Works	pran	bsrm	fahim garments
SSC (Voc)	General Electronics	fariha		chaihati
SSC (Voc)	General Mechanics	chaihati		
SSC (Voc)	Machine Tools Operation	waeyan group		
SSC (Voc)	General Electrical Works	oriayan group		
SSC (Voc)	General Electronics	toyota	tata	premeo
SSC (Voc)	General Mechanics	toyta	elion	priemo

Table-3.13: Distribution of three companies most of the industries work on by trade & TVET program

Course Type	Name of trade	Company-1	Company-2	Company-3
SSC (Voc)	Machine Tools Operation	bsrm	ksrm	ofseped bd
SSC (Voc)	General Electrical Works	gph ispat	bsrm	aks steel mills
SSC (Voc)	General Electronics	best bazar ltd	imperial trust ltd	wm21 compnay
SSC (Voc)	General Mechanics	kds garments	anowar industrial group	imperial trust ltd
SSC (Voc)	Machine Tools Operation	aci company	bashundhara	fresh company
SSC (Voc)	General Electrical Works	bashundhara group	uniliver	fresh company
SSC (Voc)	General Electronics	gps	bsrm	uniliver
SSC (Voc)	General Mechanics	bsrm	unisef garments	ksrm
SSC (Voc)	Machine Tools Operation	ibn dina hospital	towar hospital	ma moni clinic
SSC (Voc)	General Electrical Works	ma moni clinic	ibn cina hospital	tower hospital
SSC (Voc)	General Electronics	rfl		pran
SSC (Voc)	General Mechanics	rfl	sinha	pran
SSC (Voc)	Machine Tools Operation	pollibiddhut		
SSC (Voc)	General Electrical Works	pollibiddhut		
SSC (Voc)	General Electronics			rangpur sugar mills ltd
SSC (Voc)	General Mechanics	bangladesh army		haq group of indust.
SSC (Voc)	Machine Tools Operation	intech computer	ksrm	comillah it center
SSC (Voc)	General Electrical Works	comilla computer	bm garments	bsrm
SSC (Voc)	General Electronics	masud it jon	happy electronic	muradnagar computer
SSC (Voc)	General Mechanics	masud it	murad nagar computer	akhi computer
SSC (Voc)	Machine Tools Operation	school	training center	akij factory
SSC (Voc)		akij	training inst	kankartrain
SSC (Voc)	General Electrical Works	kds garments	klipton	bsrm
SSC (Voc)	General Electronics	uniliver	klipton	elit printer
SSC (Voc)	General Mechanics	e koli kalam	ajij factory	ahad jute mils
SSC (Voc)	Machine Tools Operation	ahad jute mil	econo	ajij factory
SSC (Voc)	General Electrical Works	walton		
SSC (Voc)	General Electronics	walton		
SSC (Voc)	General Mechanics	pran	school	shilpo protishtan

Table-3.13: Distribution of three companies most of the industries work on by trade & TVET program

Course Type	Name of trade	Company-1	Company-2	Company-3
SSC (Voc)	Machine Tools Operation	training center	pran	school
SSC (Voc)	General Electrical Works	dbl		transtec
SSC (Voc)	General Electronics			beximco farmacitical
SSC (Voc)	General Mechanics			ariyan group
SSC (Voc)	Machine Tools Operation	walton	next	singar
SSC (Voc)	General Electrical Works	training center	school	walton
SSC (Voc)	General Electronics	local job		ngo
SSC (Voc)	General Mechanics	garments	rupper parmanabik biddhut kendro	lged
SSC (Voc)	Machine Tools Operation	gaments	bgb job	govt job
SSC (Voc)	General Electrical Works	busing house	pran	garments
SSC (Voc)	General Electronics	shikha protishtan	walton	garments
SSC (Voc)	General Mechanics	ngo	school	army
SSC (Voc)	Machine Tools Operation			walton
SSC (Voc)	General Electrical Works	local job	self employed	sajeeb food product
SSC (Voc)	General Electronics	garments job	rahim affroj	ngo job
SSC (Voc)	General Mechanics	abul khair	jamuna group	walton
SSC (Voc)	Machine Tools Operation	somrat group	govt job	walton
SSC (Voc)	General Electrical Works			bivinno protishtan
SSC (Voc)	General Electronics	mechin tools		buet
SSC (Voc)	General Mechanics	tachshal		duet
SSC (Voc)	Machine Tools Operation	sony		walton
SSC (Voc)	General Electrical Works	school		traing center
SSC (Voc)	General Electronics	jono shastto procoushli adhi.		lgd
SSC (Voc)	General Mechanics	rh	police	polli biddhut
SSC (Voc)	Machine Tools Operation	resturent		pran
SSC (Voc)	General Electrical Works			pran
SSC (Voc)	General Electronics	police	training center	school
SSC (Voc)	General Mechanics	ngo	school	army
SSC (Voc)	Machine Tools Operation	wastern agro		majumder group of company

Table-3.13: Distribution of three companies most of the industries work on by trade & TVET program

Course Type	Name of trade	Company-1	Company-2	Company-3
SSC (Voc)		brac	branoil company	grameen bank
SSC (Voc)		car showroom	honda	
SSC (Voc)	Food & beverage service	rasturent	fast food shop	
Basic course	Food & beverage service	hotal and resturent	fast food	
Basic course	Plumbing & pipe fitting	aci motors	rfl group	stadarrs group
Basic course	Electrical House Wiring	training center	pran	navana group
Basic course	Other Trades	asha	tmss	
Basic course	Other Trades	rfl	tmss	asha
Basic course	Computer operation/ programming	ekata auto	police	arki
Basic course	Database programming	brac	police	arki
Basic course	Mobile phone servicing	police	brac	training center
Basic course	Computer operation/ programming	nrcb bank	akij factory	hero motors
Basic course	Computer operation/ programming	akij jute mills	hero motor	asia bank
Basic course	Computer operation/ programming	school	pran	minas
Basic course	Computer operation/ programming	oparetor	school	company
Basic course	Computer operation/ programming	bank	school and college	press
Basic course	Computer operation/ programming	shikkha protishtan	bank	ngo
Basic course	Computer operation/ programming	training center	pran group	
Basic course	Computer operation/ programming	walton	pran	
Basic course	Graphics design & Multimedia programming	online outsorsing		
Basic course	Computer operation/ programming	srijoni printer		
Basic course	Other Trades	aci company		
Basic course	Arc & gas Welding	sadia enterprise	mizan ent.	mithon ent.
Basic course	Computer operation/ programming	school	training center	NGO
Basic course	Computer operation/ programming	jute mills		
Basic course	Computer operation/ programming	elit computer ltd	chal dal co ltd	IT ltd
Basic course	Computer operation/ programming	gazi ireen store	utso IT ltd	sorna international ltd
Basic course	Computer operation/ programming	link three	pharmaceuticals office	
Basic course	General Electrician	mariya electric	mesars ma construction	aslam construction

Table-3.13: Distribution of three companies most of the industries work on by trade & TVET program

Course Type	Name of trade	Company-1	Company-2	Company-3
Basic course	Masonry & rod binding	kader enterprise	sonoar construction	sumon enterprise
Basic course		education institute	walton	
Basic course	Graphics design & Multimedia programming	garments	walton	
Basic course	Database programming	software company	bank	garments
Basic course	Computer operation/programming	educational institute	garments	buying house
Basic course	Computer operation/programming	pran company		
Basic course	Computer operation/programming	computer training center	garments	DBL group
Basic course	Computer operation/programming	garments	oversease tab	local ngo
Basic course	Database programming	montex group	dbl group	
Basic course	Computer operation/programming	army	school/college	ngo
Basic course	Computer operation/programming	school	ngo	training center
Basic course	Computer operation/programming	shah ciment group		
Basic course	Computer operation/programming	megna group		
Basic course	Computer operation/programming	training institute	garments	govt job
Basic course	Other Trades	garments	school	ngo job
Basic course	Refrigeration & Air Conditioning	walton	overseas job	brc dhaka
Basic course	Refrigeration & Air Conditioning	3d service dhaka	epz dhaka	walton
Basic course	Electrical House Wiring	minister	lever brothers	rfl
Basic course	Electrical House Wiring	minister		
Basic course	Other Trades	royel elegance		
Basic course	Other Trades	nitta	msa group	
Basic course	Electrical House Wiring	DBL		
Basic course	Electrical House Wiring	DBL	AMNI	
Basic course	Electrical House Wiring	mondol group		
Basic course	General Electrician	mondol group		
Basic course	Computer operation/programming	lever brothers limited		
Basic course	Computer operation/programming	sony		
Basic course	Electrical House Wiring	fokir group	meghna group	shah ciment group
Basic course	General Electrician	sina group	shah ciment group	

Table-3.13: Distribution of three companies most of the industries work on by trade & TVET program

Course Type	Name of trade	Company-1	Company-2	Company-3
Basic course	Dress making & Tailoring	bksp	tarkish hope school	
Basic course	Hardware & Networking	khan printing & press	joom bangladesh	
Basic course	Other Trades	turag garments lim.		
Basic course	Other Trades	squar pharmaceutical		
Basic course	Database programming	apex garments	varity madrasa education institute	
Basic course	Other Trades	IT center gaibantha		
Basic course	Other Trades	IT center		
Basic course	Other Trades	sajhil hospital		
Basic course	Other Trades	best stress limited	sajhil hospital	
Basic course	Graphics design & Multimedia programming	TMSS,bogura		
Basic course	Other Trades	TMSS,bogura		
Basic course	Other Trades	ibne sina diagonetry center	walton hytec park	
Basic course	Other Trades	biit		
Basic course	Other Trades	TMSS		
Basic course	Computer operation /programming	govt hospital		
Basic course	Computer operation /programming	govt hospital		
Basic course	Electrical House Wiring	comilla university	fress co	KSRM steel
Basic course	Tiles setting & Fitting	rehab construction	Abul khayer company	
Basic course	Database programming	agro and fisheries co	jonota bank	robi telicom
Basic course	Database programming	sonali bank	comilla high school	victoria college
Basic course	Computer operation /programming	united hospital	eye hospital	cumilla coat
Basic course	Computer operation/ programming	united hospital	comilla eye hospital	rubel computer center
Basic course	Welding 4G	hamim group	garments	
Basic course	Computer operation/ programming	metro computer center	etanium computer technology	bashundhara company
Basic course	Computer operation/ programming	pepsi company	rifat computer center	adharsha kindergaten school
Basic course	Computer operation/ programming	bakshimul islamiya sinior madrasa	alfahla bidda niketon	sobuj bangla school
Basic course	Computer operation/ programming	sonar bangla school	model academy school	burichang modern hospital
Basic course	Computer operation/ programming	modern hospital	gopal nagar high school	digital photoshop
Basic course	Computer operation/ programming	digital electriconic	square hospital	seba medical

Table-3.13: Distribution of three companies most of the industries work on by trade & TVET program

Course Type	Name of trade	Company-1	Company-2	Company-3
Basic course	Computer operation/programming	tower hospital	comilla EPZ	sonali computer
Basic course	Computer operation/programming	tower hospital	rosa shopping	comilla EPZ
Basic course	Other Trades	daraj online shopping	KDS garments	4H group
Basic course	Other Trades	delta clinic	KDS garments	farid garments
Basic course	Computer operation/programming	universal garments	RK garments	young one garments
Basic course	Computer operation/programming	.young one garments	universel garments	SS steel mills
Basic course	Electrical House Wiring	youngone	pacific garments	BSRM steel
Basic course	Other Trades	pacific garments	universal garments	young one garments
Basic course	Dress making & Tailoring	gennex garments	AK khan garments	Pioneer garments
Basic course	Electrical House Wiring	stack plastic company	BD food	KSRM steel
Basic course	Computer operation/programming	city bank	rupali bank	young one
Basic course	Graphics design & Multimedia programming	freelancing	dot printing	digniters prints
Basic course	Maintenance of Electrical Equipment	KDS garments	aramit aluminium ltd	aramit cement
Basic course	Computer operation/programming	jinas computer	pran company	chittagram eye hospital
Basic course	Housekeeping	cox bazar lilien hotel	suadia hotel cox bazar	sylet sonargao hotel
Basic course	Housekeeping	khulna royel hotel	cox bazar lilien hotel	sylet sonargao hotel
Basic course	Other Trades	bangladesh army		
Basic course	Other Trades	rent a car	poribohan	
Basic course	Other Trades	exim bank		
Basic course	Other Trades	exim bank		
Basic course	Other Trades	bogura technical & buisness managment	TMSS	
Basic course	Database programming	TMSS	agrani bank	janata bank ltd
Basic course	Other Trades	BS model school & college	independent school & college	
Basic course	Other Trades	TMSS	BCL super store	
Basic course	Welding 4G	private	company	
Basic course	Other Trades	mirpur aparal ltd		
Basic course	Other Trades	garments		
Basic course	Other Trades	garments		
Basic course	Food & beverage production/Service	3 star,4 star,5 star hotel	fast food shops	

Course Type	Name of trade	Company-1	Company-2	Company-3
Basic course	Food & beverage production/Service	3 star,4 star, 5 star hotel	different restaurent	
Basic course	Graphics design & Multimedia programming	free lancing		
Basic course	Computer operation/ programming	IT sector	corporate job	private company
Basic course	General Electrician	govt job	it firm	e cmmerce company
Basic course	General Electrician	electrician		
Basic course	Other Trades	outsourcing	uber pathao	private job
Basic course	Other Trades	sumsung	lg	walton
Basic course	Auto mechanics	rangs group	nitol niloy	aftab auto mobile
Basic course	Computer operation /programming	Hamim garments	Food panda	shapno super shop
Basic course	Electrical House Wiring	Megna group	Apex garments	Hamim group

REASONS FOR CHOOSING TVET

Reasons for taking up technical and vocational training	"Yes" Cases		"No" Cases	
	Number of students	%	Number of students	%
Advice from parents/ relatives	257	79.32	67	20.68
Influenced by friends	126	38.89	198	61.11
I have a strong interest in TVET	249	76.85	75	23.15
TVET graduates have better career growth	227	70.06	97	29.94
TVET graduates have good business opportunities	160	49.38	164	50.62
Free course is available	55	17.03	268	82.97
Affordable for the family	159	49.07	165	50.93
Took up TVET without any idea	82	25.31	242	74.69
TVET institute is near my place	109	33.64	215	66.36
I am inspired by past TVET graduates	125	38.58	199	61.42
I have no other option	14	4.32	310	95.68
Reputation of the institution	244	75.31	80	24.69
All Cases				

RATE YOUR TEACHERS

Table-3.15: Rating of the teachers by the TVET students	
How do you rate the proficiency of your teachers in teaching?	Scale of 1 to 10
Rating of the teachers by the graduates	Average score
The teachers are well versed about theoretical aspects of the subjects taught	7.87
The teachers are well versed about practical aspects of the subjects taught	7.88
Teachers are academically and professionally qualified to teach	7.79
Generally the syllabuses are fully covered	8.36
The teachers are organized and prepared for every class.	7.64
The teachers explain the material clearly and in ways that are easy to understand, offered alternative explanations or additional examples, and cleared up confusion.	7.92
The teachers are apt at taking practical classes and good at demonstrating the usage of various lab equipment	7.78
Teachers are punctual and utilized the class-time properly	8.02
The teachers encourage creativity in the class works and assignments	7.68

New Comments on 14 September 2021

The quality of the reports has been compromised in the following aspects:

- I. The reports have description but not analysis. A critical assessment of the current situation on skill and skill gap is required.
- II. What are the major policy messages from the study? How can the policy lessons inform the national skill development strategies?
- III. What are the major takeaway messages for the SEIP so that they can design their third tranche more efficiently?
- IV. Evolution of the sector in terms of size, productivity, skill, and relevant policies.
- V. List of occupations at four digit occupation level which require further training and the detailed list of training.