Bangladesh
SKILLS FOR TOMORROW'S JOBS:
PREPARING YOUTH FOR A FAST CHANGING ECONOMY

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BANGLADESH SKILLS FOR TOMORROW'S JOBS: PREPARING YOUTHS FOR A FAST-CHANGING ECONOMY

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OVERVIEW **AND ACKNOWLEDGEMENT**

The Skills for Tomorrow's Jobs in Bangladesh attempts to address key skills challenges and identify opportunities in the backdrop of fast technological and economic changes. It proposes mid to long-term strategic policy options that would contribute to economic growth and job creation in Bangladesh with a focus on post-secondary education and skills development sectors. It aims to inform the Government and the World Bank's jobs agenda.

The study draws upon relevant literatures from international and national sources, the government's surveys and education statistics, and analytical works undertaken by the World Bank and other agencies. Moreover, the study was extensively informed and guided by knowledge and insights gathered through the experience from the World Bank funded operations and series of consultations on skills for future jobs with relevant stakeholders in Bangladesh.

The study was prepared by a team comprising of: Shiro Nakata (Sr. Economist, GED06), Yoko Nagashima (Sr. Education Specialist, GED13), Md. Mokhlesur Rahman (Sr. Operations Officer, GED06), Tashmina Rahman (Research Analyst, GED06), Afra Rahman Chowdhury (Consultant, GED06) and Muhammad Asahabur Rahman (Consultant, GED06).

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ABBREVIATIONS **AND ACRONYMS**

a2i	Access to Information
ADB	Asian Development Bank
BBS	Bangladesh Bureau of Statistics
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BMET	Bureau of Manpower, Employment and Training
BPO	Business Process Outsourcing
BTEB	Bangladesh Technical Education Board
CAD	Computer Assisted Design
CNC	Computer Numerical Control
DoL	Directorate of Labour
DSHE	Directorate of Secondary and Higher Education
DTE	Directorate of Technical Education
EPZ	Export Processing Zone
EU	European Union
EZ	Economic Zone
FD	Finance Division
FY	Fiscal Year
FYP	Five Year Plan
GDP	Gross Domestic Product
HEQEP	Higher Education Quality Enhancement Project
ICT	Information and Communication Technology
ILO	International Labour Organization
ISC	Industry Skills Council
IT	Information Technology
LASI	Learning Assessment of Secondary Institutions
LMIC	Lower-Middle Income Countries
LMIS	Labour Market Information System
MOE	Ministry of Education
MOF	Ministry of Finance
MOI	Ministry of Industries
MOLE	Ministry of Labour and Employment
MOWCA	Ministry of Women and Children Affairs
NHDF	National Human Development Fund
NSDA	National Skills Development Authority
NSDP	National Skills Development Policy
OECD	Organisation for Economic Co-operation and Development
PPP	Public Private Partnership
PPP	Purchasing Power Parity
RMG	Ready Made Garment
RPL	Recognition of Prior Learning
R&D	Research and Development
SEIP	Skills for Employment Investment Program
SHED	Secondary and Higher Education Division
SME	Small and Medium Size Enterprise
STEM	Science, Technology, Engineering, and Mathematics
STEP	Skills and Training Enhancement Project
STEP	Skills Towards Employability and Productivity
TMED	Technical and Madrasah Education Division
TVET	Technical and Vocational Education and Training
UDC	Union Digital Centers
UGC	University Grants Commission
US$	United States Dollar

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EXECUTIVE **SUMMARY**

Bangladesh is at a crossroads to transform itself to a high-productivity growth economy, and skills will play an essential role in enabling the transition and creating more and better jobs.

Today, Bangladesh is increasingly integrated with the dynamism of global economy, and new technologies are making inroads into the country. Such changes have been impacting, in myriad and profound ways, environment of businesses, scenario of job creation, and skills required for jobs within Bangladesh. **Jobs Diagnostic Bangladesh 2017** identifies *labor market and skills as one of the three policy domains, along with macro environment & investment climate and regional & sectoral policies*, to direct coordinated policy efforts to achieve faster job creation, better quality jobs, and equitable access to jobs.

Low labor productivity is a longstanding headache for Bangladesh; accelerating investments in human capital and addressing skills challenges will hold a key to improve labor productivity and accelerate growth. Low educational attainment, despite the expansion of access to education in recent decades, and skills training are putting significant constraints on productivity of labor force in Bangladesh. Only around 46 percent of the population aged 15 years or above have attained secondary and a fraction (4 percent) have tertiary education qualifications. Participation in skills trainings after formal schooling is negligible. Only 2.1 percent of the population had any vocational training outside of formal schooling system.

Bangladesh is undergoing the period of so-called Demographic Dividend, giving extra boost to investment capacity and productivity growth which comes once in a lifetime opportunity for a country.

Technological advances and dynamic economic environment, enabled by skilled workforce, present valuable opportunities for boosting productivity and capitalizing on the demographic transition.

New technologies, partly driven by active foreign direct investments, have been gradually coming into the economic fabric of Bangladesh, creating new skills demand. For instance, garment manufacturing industries traditionally relied on labor intensive mass-production model; however, with the changing trends in apparel market and fashion industry, the industry has begun to place more importance on adoption of newer technologies to cope with higher quality standards and competitive global market. Information technologies have been leading the charge in innovation and technology transformation in Bangladesh keeping pace with the global trends. Vision 2021 envisions that by 2021 Bangladesh will be a country of educated people with skills in information technology.

Skills development challenges both on the demand and supply sides and how the two sides interact to meet the needs of today's technological changes and dynamic economy – presents promising opportunities for boosting the quality and relevance of skills development system in Bangladesh

Demand-side Issues: Changing Demands for Skills and Weak Participation and Trust in Skills Development

First of all, technologies are increasingly disrupting industries and jobs at a global scale, raising demands for high-level and low-level skills and making skills demands unpredictable. New technologies can be deeply disruptive. Diffusion of new technologies may exacerbate inequalities or displace workers from jobs if not accompanied by acquisition of relevant skills. Some, especially those in advanced economies, are seriously concerned about the possibility that automation and robots powered by artificial intelligence will wipe out many occupations from the workplace, including even those considered white collar jobs. Even when technologies do not replace the whole job, it is likely that technologies replace parts of the job and alter how tasks are undertaken. On a global scale, it is estimated that about half of the world's economy would be affected by technologies in near future. Evidences abound that technologies are affecting jobs and skills; however, it is notoriously difficult to predict the course of technological changes and business scenarios. The only thing that is predictable is that technical skills needed for jobs are increasingly becoming unpredictable. This presents a unique and serious challenge for skills development systems which now must find ways to be adaptive and remain up-to-date with the constant changes.

Experience and forecasts in neighboring countries suggest that similar changes are imminent in Bangladesh, and automation and technologies will likely impact the jobs and skills demands in Bangladesh significantly. The ASEAN countries are ahead of the game in adopting new technologies in manufacturing and service sectors. Computerized manufacturing machines such as automated cutting machines and sewing robots are increasingly prevalent in ASEAN countries. Extensive studies commissioned by ILO shows that in ASEAN countries such as Cambodia and Vietnam, where textile industries play a large part in economy as in Bangladesh, nearly three in five jobs are at high risk of being fully or partially automated. As technology adoption is making significant strides in Bangladeshi industries, and the global market is closely integrated nowadays, it is highly likely that jobs and skills demands in Bangladesh would also be impacted by automation and other technologies in very similar manner as ASEAN countries.

Despite the increasing importance of technical skills, Bangladeshi society as a whole still holds poor perception about skills training and graduates of vocational education. Enterprises are not enthusiastic about providing skills training to its workers in spite of the potential positive returns to such investment in human resources.

Supply-side Issues for Students: Effectiveness of Skills Supply – Poor Employability

Some crucial skills gaps have been identified that Bangladeshi workers should aim to enhance in order to better cope with and strive in the fast-changing economy. **Higher-order Cognitive Skills and Non-cognitive/Soft Skills:** Skills such as critical thinking, problem solving, leadership, communication, work ethics, and team work, have become essential to cope with fast changing technologies and business requirements, and are sought by employers. However, these are largely missing skills for workers in Bangladesh. **Practical Technical Skills and Knowledge for Jobs:** For professionals and technical and engineering workers, overemphasis on theoretical knowledge at the expense of practical skills during tertiary education is a cause for serious lapses in their technical competencies. **ICT Skills:** In many workplaces, workers now must be able to use information technologies to fully exploit the growth potential of new technologies;

and job opportunities in the ICT industry likely keep growing in Bangladesh. Employers are wanting to see technical workers to be better skilled in ICT. Significantly more ICT skills are needed to meet domestic and international business requirements. **Poor Foundational Skills:** Due to poor quality and relevance of education in primary and secondary education, foundational skills – literacy and numeracy – which are the basis for other high-level cognitive and job-relevant technical skills often remain inadequate, even among those entering post-secondary education. **Job Search and Career Development Skills:** Both job seekers and education institutions in Bangladesh are weak in job search skills and job placement capacity, and tend to have unrealistic expectations about their job prospects and skills requirements. This creates unnecessarily large frictions and mismatch in the job markets.

Supply-side Issues for Workers: Shortage of Skills Training Opportunities for Workers in Bangladesh

Unequitable Access for Females and Poor: Overall, there's a significant shortfall of skills development opportunities especially among females and the poor. Access to skills training opportunities has been increasing but still fall far short of meeting the demand. Skills training are particularly difficult to access for female workers and poorer groups of the labor force. Females have traditionally been underrepresented in skills development. **Management Skills, especially at the Mid-Management Level:** Good managers are hard to find in Bangladesh across the board. Business owners are often forced to fill manager positions with expats, which has led to significant amounts of hard-earned foreign currency getting siphoned off again to abroad. **Low Skilled Migrant Workers:** International migration poses unique skills challenges as skills levels of migrant workers have been slow to improve. In terms of skills composition, less skilled workers still constitute the largest share. Around 56 percent of Bangladeshi migrant workers are classified as either unskilled or semi-skilled in 2016. **Lack of Skills Training for Informal Workers:** Informal sector has been severely underserved in skills development agenda. It has largely escaped the attention of the skills development circle and little training opportunities have been made available to them.

Disconnects and Institutional Capacity Constraints in Skills Development Ecosystem

Lack of Updated Job Market Information: Labor market information is far from adequate and not well connected with job seekers and educators. Job market information about what jobs and skills/experiences are demanded is largely missing. Information in the labor market information system are limited. Job seekers tend to have limited and biased information. On-line job market platforms are still limited. **Weak Industry Collaboration and Participation:** Education and training systems in Bangladesh have been slow in developing effective partnerships with industries. Industry is the final consumer of supplied skills and employer of students coming out of education system. Collaboration with industries is essential for skills development system to deliver quality and relevant learning experience to students, especially to keep up with new technologies that are brought into use in industries. **Inadequate Capacity for Flexible Curriculum Development and Examination System:** Curriculum updating are not adequately adaptive due to the centralized control, overreliance on written examination is a long-standing issue. **Inadequate Capacity for Delivering Quality Teaching:** Quality teaching and learning becomes challenging with inadequate provision of modern learning facilities and insufficient teacher training opportunities in the education and skills training institutes. **Inadequate Implementation Capacity and Resources for Quality Assurance:** Quality assurance is still a relatively new concept in education and skills development sectors of Bangladesh, and the implementation of policy framework remain weak.

Building on discussion above, the study set forth a range of possible policy options and priority actions in three interlinked Pillars to address the challenges and produce adaptive skilled workforce that meet the needs of dynamic economy and fast-changing technologies.

Pillar 1:
Improving institutional capacity for better linkage between supply and demand sides of skills towards more adaptive skills development system

Seamless linkages between the demand and supply sides of skills are essential to ensure the industries get skilled manpower they need to make the most out of the business environment and latest productivity enhancing technologies.

- ***Labor Market Information and Responsiveness***

  Strengthen Labor Market Information and Graduates Feedback System: Availability of timely labor market information (i.e. employment opportunities, human resource and skills needs of key industries) should be strengthened as a basis for evidence based planning for skills development and to inform training institutions and trainees about employment prospects in key occupations.

  Increase Labor Market Responsiveness of Post-secondary Education: The education and training system should be held accountable for labor market relevance of their service and ultimately for employability of their graduates.

- ***Institutional Strengthening for Sector-wide Collaboration and Quality Assurance***

  Strengthen Central Planning and Coordination Facilities for Skills Development: National Skills Development Policy (NSDP) 2011 is ripe to be reviewed and updated to incorporate lessons learned. Coordination and monitoring at the national level for harmonized skills development need to be further improved through National Skills Development Authority and National Human Development Fund initiatives as well as strategic move to establish more sector-wide program approach in skills development sector.

  Speed up the Implementation of Qualification Framework and Quality Assurance System. Higher education and skills development sectors both have or will soon have laid a good foundation in recent years for qualification framework and quality assurance system as discussed earlier. The implementation of these policy initiatives needs to be expedited and sustained. In skills development, competency standards in the national skills qualification framework need to be fully implemented.

Pillar 2:
Re-orienting skills supply to prepare youths for unpredictable skills demand and uncertain economic environment

- ***Higher-order Thinking Skills and Soft Skills Development in Post-Secondary Education***

  Train Higher-order Cognitive Skills and Soft Skills in Post-Secondary Education: Education/training programs should integrate training components and teaching methods conducive to developing higher-order cognitive skills and soft skills.

  Assess Students Higher-Order Cognitive and Soft Skills in Post-Secondary Education: Measuring students' higher-order cognitive and non-cognitive skills as well as technical skills is the first step towards improving teaching and learning and ultimately education outcomes.

  Ensure Solid Foundational Skills among Post-Secondary Students: Many of post-secondary students would benefit from remedial programs to retrain their literacy and numeracy skills.

- ***Reorienting Technical Skills Development in Post-Secondary Education***

  Expand Training in ICT in Post-Secondary Education: Skills training in ICT should be further accelerated to enhance workplace productivity and for creation of ICT-enabled jobs.

  Make STEM more Practical and Hands-on in Post-Secondary Education: STEM education and training with focus on practical skills should be strengthened across education cycles particularly at the tertiary education level.

- ***Capacity Development of Teachers, Institutions, and Students for Better Employability***

  Train Teaching Skills of Post-Secondary Teachers to Meet New Skills Requirements: All those reforms discussed above require teachers in post-secondary institutions to have a new set of teaching competencies, especially for Active Learning methods which is known to have positive impact on students' higher-order cognitive skills.

  Upgrade Teaching and Learning Environment of Post-Secondary Institutions: Capacity of institutions in teaching and learning facilities and equipment needs to be upgraded. Performance-based institutional grant system should be expanded to provide essential facilities needed to implement updated curriculum and new pedagogical methods.

  Improve Skills for Job Search and Career Development among Post-Secondary Students: Skills matching does not occur automatically. Job search and career development skills would need to be enhanced to reduce frictions in job market.

- ***Upskilling for Businesses and Professional Development for Workers***

  Expand Training for Female Workers and Female Business Owners: Female workers deserve more skills development opportunities for jobs and entrepreneurship to be solvent self-employed business owners.

  Expand Training in Managerial Skills for Mid-Career Professionals: Opportunities for skills development of mid-level managers should be expanded vigorously to alleviate severe human resource bottleneck for managerial positions.

  Establish Lifelong Learning System for Mid-Career Workers: Skills development must be continual and lifelong in the age of rapid technological changes. Combined role of higher education institutions and TVET institutes will make most effective contribution that meet diverse skills needs for new technologies.

  Expand and Incentivize Skills Training for the Migrant Workers: Oversees' workers need to upgrade the skills prior to leaving the country and after coming back to the country. Proper incentive mechanism and skills recognition system should be in place to motivate migrant workers to receive trainings.

Pillar 3

Greater involvement of the demand-side of skills - private sector participation in skills development

Build Brand of Skills of Bangladesh and Expand Facilities for Private Sector Participation in Skills Development: Private participation and partnership in skills development is a vital element of workforce development. It takes on various forms, and can be facilitated with public support. The government should fully embrace the public private partnership approach and promote it wherever possible in skills agenda.

Incentivize Employer-led Skills Training at Workplace through PPP: Private sector-led skills trainings, both pre- and post-employment, have been underutilized in Bangladesh. Public support in the form of financial incentive and partnership with employers' associations would be essential to alleviate risks. As employer are training providers themselves, potential capacity for training and employment is huge if right incentives are in place.

Deepen Partnership with Private Sector for Improving Quality and Relevance of Post-Secondary Education: There are still so much to be done in Bangladesh about joining hands with private sector to improve quality and relevance of skills development. Partnership with industry sector have been gaining traction in TVET and university sectors alike, with the support from the relevant ministries and various projects.

Establish In-service Training Programs for Industry Professionals at Post-Secondary Institutions: Partnership for in-service training provision by tertiary institutions for industry professionals have been piloted and shown promising. This type of partnership for in-service training for industry professionals should be explored and expanded further.

Establish Specialized Skills and Research Partnership in Industrial Zones/Clusters with Post-Secondary Institutions: Partnership between post-secondary institutions and private sector should be explored to set up special training programs in industrial zones. On the R&D side, universities can act as an innovation facilitator to support local adaptation of imported technologies in the zones.

1 BIG TRENDS: GROWTH POTENTIAL, PRODUCTIVITY, AND TECHNOLOGY CHANGES IN BANGLADESH

1.1 BACKGROUND IN BANGLADESH

1. Bangladesh is now at a crossroads to transform itself to a high-productivity growth economy for more and better job creation. Reaching the lower end of middle-income country status in 2014 – a goal of Vision 2021 – the challenge now is to sustain and accelerate socio-economic growth so it can move up the ladder within a middle-income bracket[1]. A key to achieving this ambition lies in making a fundamental transformation from low-productivity and low-wage development model to high-productivity and high-wage growth for everyone. To boost the productivity of economy and job creation, in addition to making more investment in physical capital, the country must invest more in human capital accumulation to raise skills of its workforce[2]. Today, Bangladesh is increasingly integrated with the dynamism of global economy, and new technologies are making inroads into the country. Such changes have been impacting, in myriad and profound ways, environment of businesses, scenario of job creation, and skills required for jobs within Bangladesh. Jobs Diagnostic Bangladesh 2017 identifies labor market and skills as one of the three policy domains, along with macro environment & investment climate and regional & sectoral policies, to direct coordinated policy efforts to achieve faster job creation, better quality jobs, and equitable access to jobs.

2. Bangladesh has made remarkable success in economic growth and poverty reduction, driven by broad-based income growth[3]. Bangladesh economy has been growing steadily at high rates over the past decade with annual real GDP growth rate

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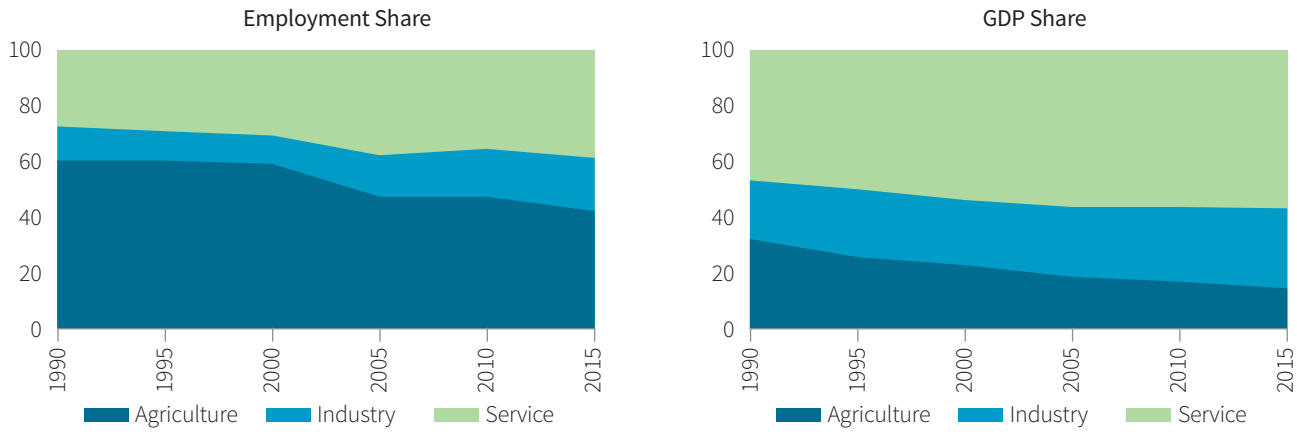
[1] The World Bank's Country Partnership Framework FY16-20 identifies several factors contributed to the resilience of Bangladeshi economy during the time of a volatile global economy, including sound macro-economic fundamentals, strong export and remittances, and insulated financial market.

[2] The 7th Five Year Plan calls for significant expansion and reforms of skills development in Bangladesh to transform itself from low-skill low-wage equilibrium to higher-skill higher wage virtuous cycle.

[3] The World Bank's Bangladesh Development Update 2016 estimates the extreme poverty rate of Bangladesh at $1.90 threshold (in 2011 PPP) to be 18.5 percent (around 28 million poor people) in 2010, down from 33.7 percent and 44.2 million poor people in 2000, consistently following the declining trend over the past 25 years. The report also found that per capita expenditure of the poorest 40 percent of the population grew faster than that of the total population during 2005-2010.



Source: World Development Indicators

Figure 1: Share of Economic Sectors in GDP and Employment

of around six percent. The growth has been underpinned by the large-scale employment expansion in manufacturing, especially RMG[4], and services sectors. The country appears poised to continue robust economic growth in the near and medium-term, thanks to healthy export growth and domestic demand[5]. Economic structure of the country has been dynamically changing. Ever greater share of GDP is being generated in industry, especially in manufacturing industry, whilst agriculture sector's role in economy, though still employs a substantial share of labor force, has shrunk over the past decades. Overall investment (both public and private) grew by 8.6% annually between 2003-2015.

3. Bangladesh is undergoing the period of so-called Demographic Dividend, giving extra boost to investment capacity and productivity gains; it should, however, be cautioned that the window of opportunity will be closing quickly. Dependency ratio in Bangladesh declined drastically from 91.9 (per 100 working age population) to 52.5 between 1980-2015. Demographic dividend would certainly be a boon to economic growth in Bangladesh. Other countries in Asia such as South Korea, Taiwan, Thailand and Indonesia, have successfully achieved accelerated economic growth over the last four decades of the 20th century when they had their demographic dividend[6]. The window of opportunity for Bangladesh will not be open forever; rather it will start closing soon. The demographic dividend for Bangladesh would mature by 2030, when the share of working age population is expected to reach its peak, and by 2040, the period of demographic dividend for Bangladesh would start to close[7]. In other words, Bangladesh has just less than 30 years left to actually cash in on this valuable opportunity to increase investment and boost economic growth. Given the long-term nature of educational investment, 30 years will by no means give time to slack. Bangladesh needs to act vigorously now to prepare productive workforce if it is to reap the benefit.

4. Furthermore, domestic migration brought more of the labor force away from rural areas to cities and towns in search for wage jobs and higher productivity non-agricultural occupations[8]. Between 2000-2010, the share of population living in official urban areas increased by 1.69 percent annually in Bangladesh, faster urbanization than South Asia as a whole[9]. Of all internal migration, 41% are from rural to urban areas while 53% males and around 11% female migrants move to cities for jobs. Rural migrants are mostly absorbed in manufacturing sector as notably 43% rural migrants are in formal jobs. Due to increasing demand from RMG sector, more female workers are moving to cities now. Migration for urban employment can shift

4 RMG sector alone is estimated to employ around 4 million workers in 2015, growing from around 1.8 million workers in 2000 (Bangladesh Bureau of Statistics, 2017).

6 See, for example, Mason & Kinugasa (2005). They argue that demographic dividends made modest contributions to per capita GDP growth of East Asian countries between 1960 and 2000, for instance, 9.2% of China's growth and 15.5% of Thailand's growth.

7 See, for instance, Martin (2012).

8 Since 1990's, Bangladesh recorded an exceptional productivity gains in agriculture production. This made possible massive outflow of productive age population from farming in rural areas to working in industry and service sectors.

9 According to Ellis & Roberts (2016).

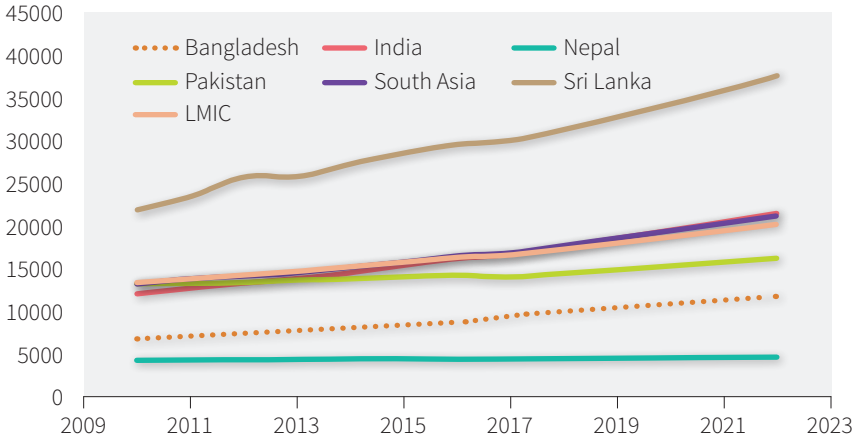
workforce to higher productivity jobs and enhance the standard of living for workers. However, these new comers often have minimum level of skills. To ensure orderly urban migration and stable employment, extensive skills training programs are needed for these internal migrant workers to prepare them for new jobs in cities.

5. Growth in exports, driven by RMG manufacturing, has been a major driving force of growth of manufacturing sector, job creation, and poverty reduction in Bangladesh. Export of goods and service was equivalent of around 17 percent of GDP in 2015, nearly tripled from mere 5.9 percent in 1990. During the same period, RMG export has shown a remarkable increase, and has been the single biggest contributor for export growth. RMG export accounted for only around 41 percent of the total export in 1990, then it quickly swelled to make up 82% of exports by 2015[10]. It also has been the biggest driver of large scale job creation in manufacturing sector during the 2000s. Bangladesh is the fifth largest RMG exporter to EU now. The progress of RMG sector has contributed to lifting millions of people out of poverty and especially empowered millions of young female worker through opportunities for income generation and skills attainment. Moving forward, RMG sector, along with other emerging industries[11], will likely continue to be a vital industry for economic growth and job creation in Bangladesh. Adequate supply of highly skilled manpower to RMG sector is of critical importance.

1.2 LABOR PRODUCTIVITY AND LABOR FORCE IN BANGLADESH

6. Low labor productivity is a longstanding headache for Bangladesh; accelerating investments in technologies and addressing skills constraints will hold a key for Bangladesh to further improve labor productivity, accelerate economic growth, and raise income levels. Although Bangladesh continues with strong economic growth, key challenges remain. Overall, average labor productivity in Bangladesh has been unsatisfactory compared to international standard. Despite high overall productivity gains, labor productivity grew only by 3.4% per year between 2010-2015; much slower compared to other Asian countries. The Bangladesh Jobs Diagnostics shows that the contribution of total factor productivity (more efficient use of all inputs) to the productivity gain has been negligible in the past decades in Bangladesh. In other words, the productivity improvements in recent years occurred largely thanks to capital deepening and demographic changes, and not so much by means of technology growth and efficient use of economic resources. To break through the low productivity growth, the role of technology and human capital improvement would be of crucial importance[12].

7. Weak human capital - low educational attainment and skills training - is putting significant constraints on productivity of labor force in Bangladesh. Generally, education attainment of Bangladesh workforce is still weak, despite the expansion of access to education in recent decades. According to the most recent labour force survey, only a little less than half (around 46 percent) of the population aged 15 years or above have attained secondary education or higher levels of education. Only



Source: ILOSTAT retrieved on Feb 21, 2018

Figure 2: Labor productivity, GDP per person employed, estimates and projections in 2011 US$ in PPP

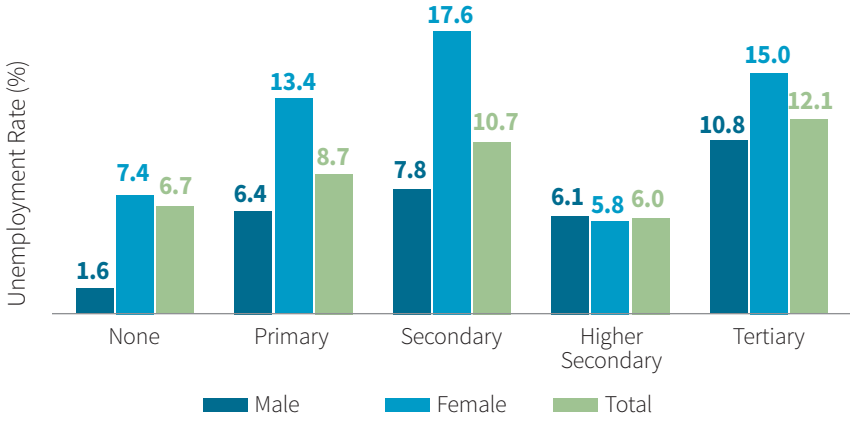
[10] According to BBS statistics, RMG export accounted for around 50 percent of total export in 1990, 75 percent in 2000, and 82 percent in 2015. In 2015, the RMG sector in Bangladesh earned around US$28.1 billion, out of the total export of US$34.3 billion.

[11] One estimate shows that in coming several years, seven key sectors including RMG (i.e., ICT, pharmaceutical, agribusiness, ship building, light engineering, labor intensive export industries, and RMG) would be the main engines for job creation in Bangladesh.

[12] The importance of human capital in defining total factor productivity has been strongly supported in empirical literature and economic development theories. See for instance Wei & Hao (2011). Technology advances need to be supported by strong skills enhancement. A study in ASEAN countries found that skills shortages as well as affordability of technologies are the biggest obstacles to technology adoption in enterprises (Chang, J. et al., 2016).

a fraction (4 percent) have tertiary education qualifications. After leaving formal education system, ideally, workers should take part in various re-skilling training to remain up-to-date with new technologies at workplace; however, prevalence of participation in skills trainings is still negligible. Only 2.1 percent of the population above 15 years of age reported having had any vocational training outside of formal schooling system. Private companies are often uninterested in providing trainings to their employees.

8. Even when education and skills training are provided, its quality and relevance to industry needs are often cast into serious question. Most recent survey confirms the growing concerns and worrying trend. Education and skills development sector has an important role to play to ensure students and workers of today will have right skill sets to reap the benefit of technological advances and meet the skills needs of emerging industries in Bangladesh. However, the labor force survey 2016/17 revealed the unemployment rate among youth (age group of 15-24 years) to be 10.2 percent, higher than South Asian average of 9.4 percent. The bad news is that youth aged 15-29 years with tertiary education qualifications are faring worse than less educated peers with the highest unemployment rate of around 12 percent (see figure 3). They often experience prolonged joblessness. More than a third (38 percent) of unemployed youth with tertiary education had remained unemployed for more than one year[13]. School-to-work transition is rocky for many tertiary graduates[14]. It seems an unfortunate reality of recent years that young graduates



Source: Labour Force Survey 2015/16

Figure 3: Unemployment Rate among Youth (aged 15-29) by Education Attainment Level

from tertiary education, for various reasons, find themselves caught up in harsh job market environment and have to risk prolonged joblessness, while employers continue to lament difficulties in finding job candidates with right skill sets.

9. The 'youth bulge' keeps putting significant pressure on the education and skills training systems. Youthful population is a boon to the productivity but also poses a significant challenge. Bangladesh has around 62 million working age population in the labor force as of 2015. Every year it is estimated that around 2 million youths are newly joining the labor force. This is placing enormous pressure to the economy to create adequate number of jobs to employ these new entrants in the labor market. The World Bank's recently completed Jobs Diagnostics Bangladesh 2017 illustrates healthy employment growth in the last decade, but warns about sign of slow-down in job creation since 2010. Education system is also under significant pressure. The significant improvement in the access to basic and secondary education in Bangladesh over the last decades has led to the surge in the number of graduates of secondary school wishing to continue to higher levels of education. This demographic pressure has pushed up enrollment and created mushrooming of universities and colleges especially private institutions, which has been hampering the quality of higher education in the absence of proper quality assurance mechanism.

10. Upskilling of female workers is vital to improve productivity as well as gender equity. The share of women in the labor force increased from around 24 percent to 35 percent between 2000-2015[15]. International comparison shows Bangladesh is performing better than most of the other South Asian countries but not as good as it's East Asian comparators. Female labor force participation is especially high among those with tertiary education qualification (around 53 percent in 2015). Though the majority of female work force continue to be employed in agriculture (63 percent in 2015), around 40 percent of female workers in non-

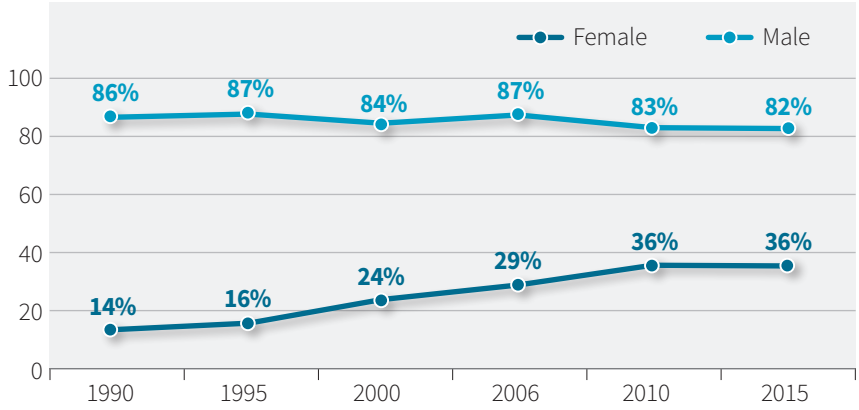
[13] According to the World Bank's forthcoming tracer study on college graduates in Bangladesh.

[14] Recently conducted tracer studies on polytechnic graduates and tertiary college graduates found unemployment rates two years after graduation to be around 40% and 70%, respectively.

[15] Recent slowdown in job creation in manufacturing would partially explain reduced labor force participation rate in 2015 (World Bank. (forthcoming). Bangladesh Jobs Diagnostics).

agricultural occupations are absorbed in manufacturing, presumably much to the credit of RMG sector. Furthermore, not only that more females are now working, but also they are bringing in more earnings relative to their male counterpart. Gender wage gaps, after controlled for age, education and geography, are found to have declined steadily over time, though gap still remain[16]. Gender gaps still remain in participation as well. Female labor participation rate is still less than half of males for 15-60 years according to the latest Labour Force Survey 2016. Skills training would play an important role to bring these women into the labor market and enhance their productivity.

11. Informal sector employment, prevalent in Bangladesh labor market, is associated with poor job quality, low labor productivity and limited skills attainment,. Jobs in informal sector typically lack basic social and legal protections or other employment benefits. Overall, 86 percent of all workers and 95 percent of female workers are working in informal sector jobs in Bangladesh, according to the latest Labour Force Survey 2016. Even among non-agricultural jobs informal employment is the norm, accounting for 90 percent and 70 percent of jobs in industry and service sectors respectively. Incidents of informal employment would progressively go down as the worker's level of education attainment increases. For instance, around one third of those with higher secondary education are employed in formal sector jobs.



Source: Bangladesh Labour Force Survey, various years

Figure 4: Labor Force Participation Rates in Bangladesh by Gender (%)

1.3 CHANGING TECHNOLOGIES AND ECONOMIC ENVIRONMENT OF BANGLADESH

12. Technologies and innovation have profound potentials to offer solutions to many of today's development challenges and to spur productivity and long-term economic development. Higher investment in skills development to support adoption of new technologies is placed at the top of national development agenda in the 7th Five Year Plan (FYP) to improve labor productivity and boost job creation. Bangladesh's huge success in raising agricultural productivity, for instance, was largely thanks to development and diffusion of improved technologies such as new crops and harvesting techniques[17]. The 7th FYP highlights that adoption of new technologies at workplace coupled with appropriate skills enhancement would stimulate total factor productivity growth in Bangladesh. Stronger economic growth and job creation in Bangladesh in future would hinges upon having more human capital and productivity enhancing technologies.

13. New technologies, partly driven by active foreign direct investments, have been gradually coming into the economic fabric of Bangladesh, creating new skills demand. Traditionally garment manufacturing industries relied on labor intensive mass-production model and had limited focus on technologies. However, with the changing trends in apparel market and fashion industry, the industry has begun to place more importance on adoption of newer technologies to cope with fast changing demands from customers and higher quality standards, and remain competitive in the global export market. According to a study, technologies that have recently been introduced in RMG industry in emerging economies include: robotics for automated assembly line, high-speed sewing machines, new pressing and fusing machines, and computer-aided designing and manufacturing[18]. Though still at a nascent stage, new production technologies are

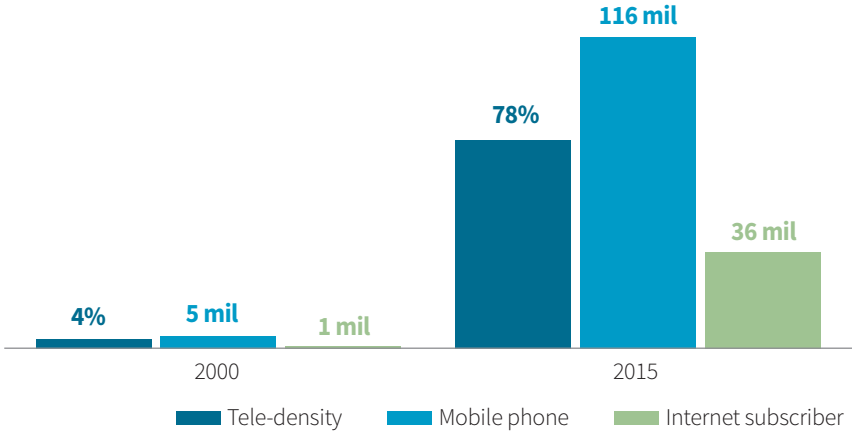
[16] According to estimations by Bangladesh Jobs Diagnostics (abid).

[17] The government has been actively working to promote agricultural research and development with special attention to rice production. Application of improved technologies, including greater use of ICT-based solutions, continues to be one of the core strategies for agricultural development under the 7th FYP.

[18] See, Yunus & Yamagata (2012).

expected to play a larger role in the garment manufacturing industry of Bangladesh as well and seen as essential for achieving $50 billion export target by 2021[19]. For instance, to promote technology dissemination, GARMENTECH Bangladesh has been the major technology tradeshow which showcases latest production technologies for garment manufacturing for Bangladeshi apparel manufacturers. At the same time, to fully utilize technologies to produce better quality products at lower costs, the industry needs to have a pool of skilled workers who can support and operate advance technologies. In this respect, the industry association, BGMEA, has taken a lead in establishing specialized institutions dedicated to garment and fashion related technologies. Today, numerous education and training institutes, including universities, are offering courses and departments specialized in fashion technologies and textile engineering, offering Diploma, Bachelor and Masters degrees[20].

14. Information technologies have been leading the charge in innovation and technology dissemination to help address socio-economic challenges in Bangladesh. Moving forward, the country is likely to increase the pace of adoption of information technologies in major economic sectors to remain competitive in the global market. Vision 2021 envisions that by 2021 Bangladesh will be known as a country of educated people with skills in information technology. Tele-density (the share of individuals with telephone connection) in the country increased from less than four percent to 78 percent between 2004-2015 (Figure 5). With increased business areas, the ICT sector has been contributing to economic growth of the country and is expected to further expand its export[21] under the 7th FYP. Capacity development in ICT is also seen as an area that merits priority actions to support further and broader integration of Bangladesh into the global value chain. Under the banner of Digital Bangladesh[22], ICT penetration, though with a lower rate than many other countries, has been growing and creating potentials for significant productivity gains and job creation. The government is leading the efforts by actively integrating ICT to improve efficiency and transparency at the central and local government institutions, and has been proactive in expanding and upgrading ICT education and training opportunities. For instance, Union Digital Centers (UDCs) have contributed to improved governance at local level, and the Access to Information (a2i) initiative has enhanced the state of e-governance at the local government through implementation of ICT programs, hardware and software, and technical assistance. As laid out in the 7th FYP, adoption of improved technologies is holding a key to improving the total factor productivity. With high human capital investment in skills acquisition along with high investment in technologies and supporting infrastructure would bring up the rate of economic growth of Bangladesh in coming years.



Source: Digital Bangladesh Update

Figure 5: Penetration of ICT in Bangladesh

[19] Though a full picture of technology adoption in the textile industry in Bangladesh is yet to be well documented, a number of anecdotal evidences indicate growing presence and importance of technology adoption in the industry. See, for instance, articles like: "Garmentech Bangladesh 2017 enthralls industry with latest technologies". https://www.apparelresources.com/events-news/garmentech-bangladesh-2017-enthrals-industry-with-latest-technology/; "Bangladesh garment sector needs to invest in technology". http://www.fibre2fashion.com/news/apparel-news/-bangladesh-garment-sector-needs-to-invest-in-technology--191498-newsdetails.htm; and "Production in Bangladesh: Overcoming Operational Challenges". http://economists-pick-research.hktdc.com/business-news/article/Research-Articles/Production-in-Bangladesh-Overcoming-Operational-Challenges/rp/en/1/1X000000/1X0A8DO9.htm.

[20] Just to name a few: Bangladesh University of Textiles (BUTEX); National Institute of Fashion Technology (NIFT), Bangladesh; BGMEA University of Fashion and Technology (BUFT); Chittagong BGMEA Institute of Fashion and Technology (CBIFT); Shanto-Mariam University of Creative Technology; and Textile Engineering Colleges.

[21] Export of ICT services nearly doubled between 2010 and 2014 reaching around US$ 450 million. Bangladesh aims to export US$1 billion worth of ICT services by 2018. See an article, "ICT exports much higher than reported". http://www.thedailystar.net/business/ict-exports-much-higher-reported-minister-1344502.

[22] To support Digital Bangladesh initiative, the government has established/enacted a number of policies and regulatory frameworks, including, among others, ICT Policy 2009/2015, ICT Act 2013, Right to Information Act 2009, and Hi-Tech Park Authority Act 2010.

15. Technologies are opening up new opportunities and potential for economies to improve productivity and create jobs if adequate and right skills are available. As technologies become more sophisticated by the day, the trend will likely pick up its speed in future. Uncertainty and unpredictability surrounding jobs and skills are palpable across the globe. However, it's also been shown that even if technologies are introduced, many occupations continue to require non-routine tasks such as human interactions, flexibility, and problem solving, which cannot be readily replaceable by machines and technologies[23]. Computers may replace unbundled sets of routine tasks while that allows workers to focus on more creative tasks and improve quality and efficiency of their jobs. Skills of workers matter more than ever in such modern workplaces. The question is whether education and skills development systems are capable to equip workers with skills and knowledge to take advantage of new technologies in their workplaces.

1.4 WHAT IS THE SKILLS DEVELOPMENT AND WHO ARE THE PEOPLE NEEDING THEM?

16. The conceptual framework below presents a simple supply and demand model of the skills development ecosystem and how they are influenced and interact. On the demand side, skills demanded are strongly and continuously influenced by multiple factors of the economy, which are becoming more fluid in recent decades. On the supply side, the main supplier of skills development are education and skills training systems, which are facing a number of quality, relevance, and access issues. Labor market links the supply and demand side through skills matching and signaling functions.

17. Skills are a multi-dimensional and multi-stage concept, and interdependent. Skills are developed progressively over an individual's life in stages, each building from the previous one, initiating from pre-primary to primary and secondary education and finally to tertiary education and on-the-job training as well as professional training and adult education. In this spectrum, for the purpose of this paper, skills for jobs can be defined to encompass the following[24]: (i) **Foundational cognitive skills** (such as basic literary and numeracy, and basic science knowledge that are typically acquired in basic education); (ii) H**igher-order cognitive skills** (such as analytical skill, critical thinking, problem solving, effective communication, leadership skills that are typically acquired in secondary and tertiary education); (iii) **Non-cognitive/ Soft skills**[25] (such as socio-emotional skills, personality traits[26], behavior, discipline, and work ethics, which are typically acquired at any point through schooling, life experiences, and interacting with others); and finally, (iv) **Technical skills** (job relevant professional skills applicable to specific occupations or sectors; which are typically acquired through

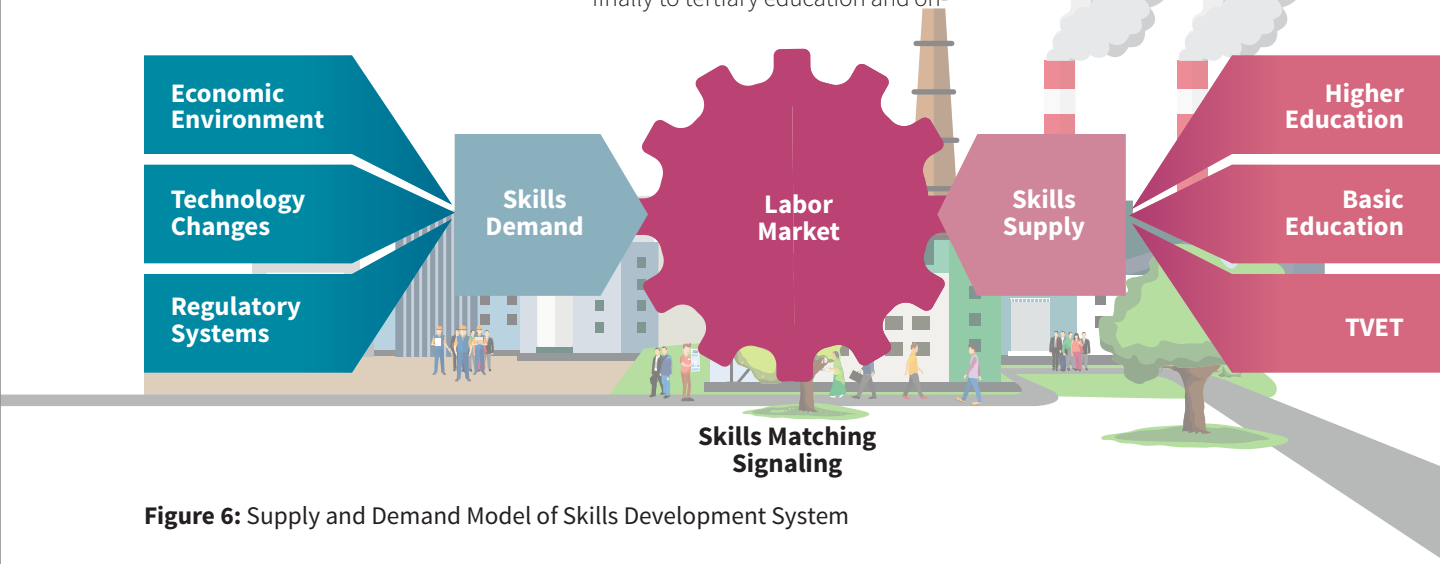


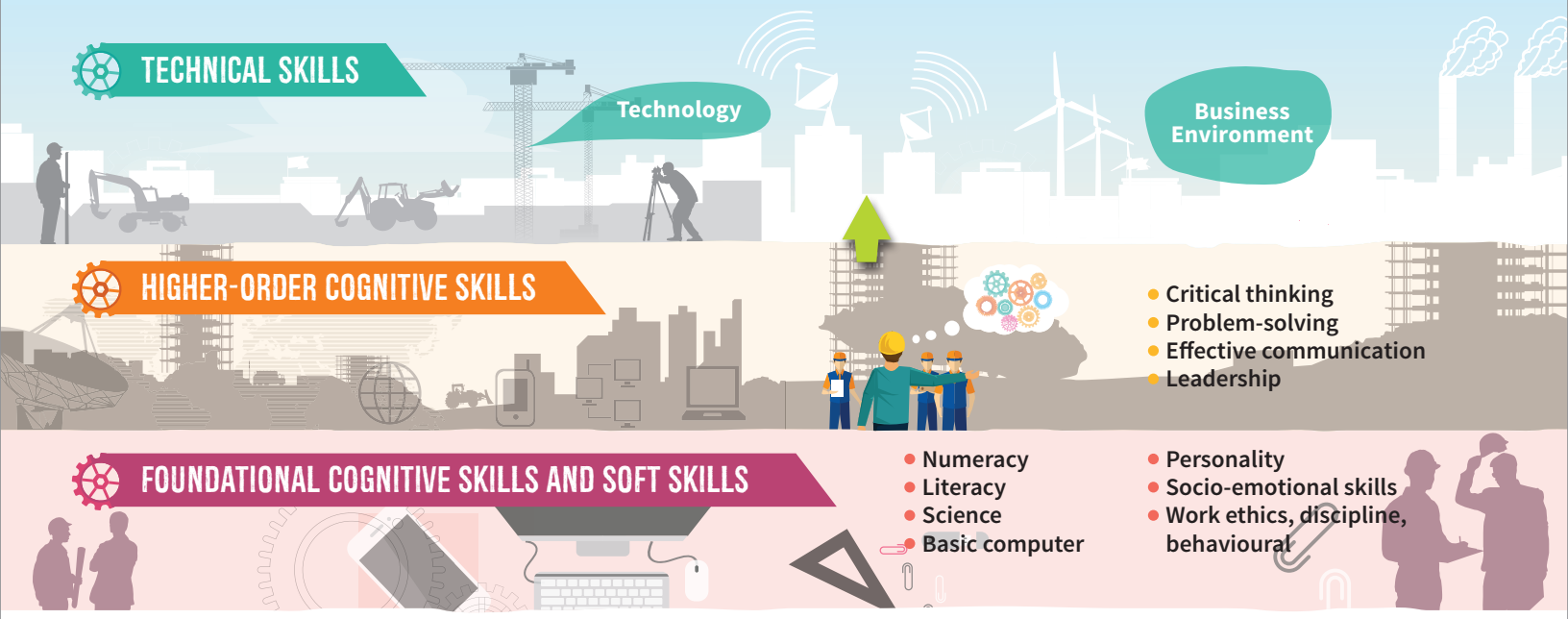
Figure 6: Supply and Demand Model of Skills Development System

[23] See, for instance, Autor D.H. (2015);

[24] The World Bank's Skills Towards Employability and Productivity (STEP) Skills Measurement Surveys define skills in three broad types: (i) Cognitive skills, defined to include literacy, numeracy, and the ability to solve abstract problems; (ii) Socio-emotional skills (non-cognitive/soft skills), which cover traits in various domains like social, emotional, personality, attitudinal and behavior; and (iii) Job-relevant skills, which are job-related and developed based on cognitive and soft skills. This paper further breaks down Cognitive skills into Foundational and Higher-order cognitive skills to differentiate the level of cognitive complexity and identify education levels through which these skills are typically acquired.

[25] Growing body of literature identifies significant economic returns to non-cognitive and soft skills (see, for instance, Deming (2017);

[26] Contrary to popular perception, researches show that personality traits are not fixed at an early stage of life. Like cognitive skills, personality skills are malleable at later stages and can evolve through parental investments, educational and life experiences (Borghans et al., 2008).



Source: Adapted from Pierre et al. (2014). STEP Skills Measurement Surveys.

Figure 7: Composition of Skills for Jobs

apprenticeship, pre-employment training, and on-the-job training, and also in TVET and higher education in specialized subjects). In terms of the scope of analysis, discussion of this study is mainly fixated on skills development beyond secondary education cycle (i.e. post-secondary education and workforce development) which have more immediate relevance to the real economy.

18. In current economies, technical skills needed for the job are increasingly fluid and unpredictable due to changing technologies and business environment. Because of that, workers' competencies increasingly depend on ones' ability and mindset to flexibly adapt to new technologies and environment through continuous learning and re-learning. Strong foundational skills, non-cognitive skills, and higher-order cognitive skills are expected to enable effective and efficient acquisition of new technical skills as depicted in the figure below.

19. Skills development beneficiaries are (i) students who are still in education system and (ii) workers who already left education system. From skill development system's perspective, students can be considered as 'flow' who will soon join the labor force hopefully with right skill sets, and workers as 'stock' already pooled in the labor force. To upgrade the skills level of the country's manpower, both 'flow' and 'stock' need to be addressed side by side – fixing education and training system for students while providing relevant skills training to workers. In Bangladesh, around 2 million school-leavers are newly entering job market annually[27], while existing workforce of around 62 million men and women needs re-skilling opportunities[28].

20. Furthermore, workers typically consist of several sub-groups, each facing unique skills challenges and skills development needs. Major groups of workers and their skills training needs would include: (a) **Entry-level workers/new graduate job seekers**, typically needing higher-order cognitive skills and job relevant skills trainings for finding employment and facilitating transition into the world of work; (b) **Out-of-school youths and school drop-outs**, typically needing to develop foundational cognitive skills and non-cognitive skills, along with basic job relevant skills; (c) **Unemployed in job transition**, typically needing to acquire new job relevant skills for new jobs; (d) **Employed workers**, typically needing to upgrade job relevant skills and higher-order cognitive skills through on-the-job training for new technologies and job responsibilities; (e) **Female workers**, typically needing specific occupational skills; (f) **Migrant workers**, typically needing job relevant skills demanded in overseas job market; and (g) **Informal sector workers**, typically needing various foundational cognitive skills and job relevant skills.

[27] The Sixth Five Year Plan estimated that around 9.2 million workers would newly enter the job market over the five-year period.

[28] The figures are according to the Labour Force Survey 2015/16. It is estimated that approximately 43 million male and 19 million females are in the labor force in Bangladesh.

2 CHALLENGES AND OPPORTUNITIES OF SKILLS DEVELOPMENT FOR CHANGING TECHNOLOGY AND ECONOMY: WHAT ARE MISSING?

21. In the context of technological changes and dynamic economy in Bangladesh, a set of skills development challenges on both demand and supply sides need to be tackled. This chapter attempts to summarize those challenges for students and workers, based on experience of on-going projects, analysis on recent data and literature, and consultations with the stakeholders.

2.1 DEMAND-SIDE ISSUES: CHANGING DEMANDS FOR SKILLS AND WEAK PARTICIPATION AND TRUST IN SKILLS DEVELOPMENT

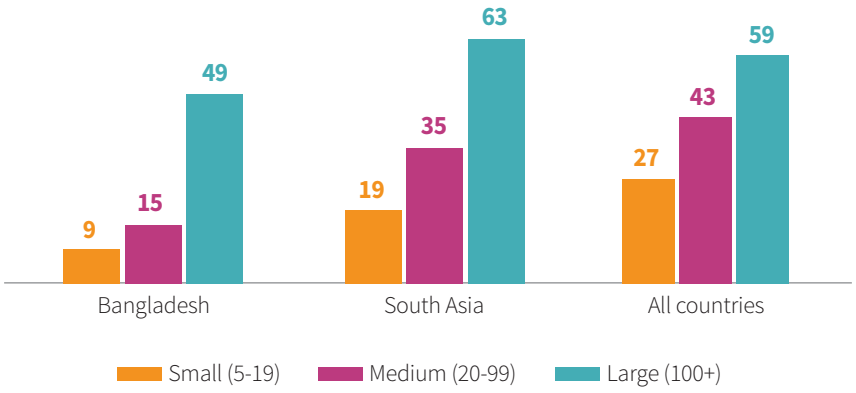
22. First of all, technologies are increasingly disrupting industries and jobs on a global scale, polarizing skills demands at high and low ends, and making skills demands unpredictable. New technologies can be deeply disruptive. Diffusion of new technologies may exacerbate inequalities if it was not accompanied by acquisition of relevant skills among wider population or when many of workers who were displaced by emerging technologies ended up unemployed[29]. Some, especially those in advanced economies, are seriously concerned about possibility that automation and robots powered by artificial intelligence will wipe out many of occupations from the workplace, including even those considered white collar jobs. For instance, Brynjolfsson & McAfee (2011, 2014) argue that with exponential increase of computing power, computers are encroaching into work domains normally reserved for people; Frey & Osborne (2013) estimates that as much as around 47% of total US employment and 35% of UK's are at risk of being computerized in 20 years. Even when technologies do not replace the

[29] OECD's recent report (OECD, 2016) discusses in length the potential and risks of technology diffusion, and points to the importance of wide dissemination of skills in ensuring more equitable outcomes of diffusion of new technologies.

whole job, it is likely that technologies replace parts of the job and alter how tasks are undertaken. Researchers and industry experts are generally in agreement that technologies are impacting jobs and skills in significant ways. Most of the jobs that exist today will likely be affected by technology adoptions. For instance, an analysis on 2,000 occupations by McKinsey found that based on currently available technologies, around 60 percent of all jobs today have at least 30 percent of tasks that can be automated. On a global scale, it is estimated that about half of the world's economy would be affected by technologies in near future. Furthermore, technologies are impacting skills requirement at workplace. An estimation based on the Survey of Adult Skills (PIAAC) by OECD shows that digitization is increasing demand for high-skilled tasks which require problem-solving and team works while reducing the need for routine and manual tasks. The study also shows that across countries, 9 percent of jobs in OECD countries are at risk of being replaced by automation, and 25 percent of jobs will be changed drastically because of automation. Evidences abound that technologies are affecting jobs and skills; however, it is notoriously difficult to predict the course of technological changes and business scenarios. The only thing that is predictable is that technical skills needed for jobs are increasingly becoming unpredictable. This presents a unique and serious challenge for skills development systems which now have to find ways to be adaptive and remain up-to-date with the constant changes.

23. Experience and forecasts in neighboring countries suggest that similar changes are imminent in Bangladesh, and automation and technologies will likely impact the jobs and skills demands in Bangladesh in significant ways. The ASEAN countries are ahead of the game in adopting new technologies in manufacturing and service sectors. Computerized manufacturing machines such as automated cutting machines and sewing robots are increasingly prevalent in ASEAN countries. Extensive studies (Chang, J. et al., 2016) commissioned by ILO shows that in ASEAN countries such as Cambodia and Vietnam, where textile industries play a large part in economy as in Bangladesh, nearly three in five jobs are at high risk of being fully or partially automated. Introducing cutting machines help factories cut costs and improve efficiency, but would replace many manual cutters. Technologies are likely to continue to shape the future of industry and service sectors in those countries. The study indicates that across ASEAN a wide array of industries including hotels and restaurants, wholesale and retails, construction, and manufacturing have high capacity for automation, and more than half of workers in such industries will likely be exposed to automation in future. Impacts on workers are not homogeneous. Overall, it is expected that female workers and less educated workers will be more severely affected by automation. As technology adoption is making significant strides in Bangladeshi industries, as discussed earlier, and the global market is closely integrated nowadays, it is highly likely that jobs and skills demands in Bangladesh would also be impacted by automation and other technologies in very similar manner as ASEAN countries.

24. Skills provision by private industries – skills demander themselves – are still largely confined to large firms, but has a huge potential of improving relevance of skills development for workers in Bangladesh. Employers, as users of trained work force, would have a reasonable economic incentive to train their current and future employees at workplace for skills that are directly relevant to their business requirements. For current employees, employee trainings, often integrated in the performance management system, are common practice in many countries, and known to yield high economic returns over a short- to long-term in various forms such as higher worker productivity and better retention of loyal workers. For future employees, apprenticeship is one type of workplace-based training where trainees / potential future employees gain job-relevant practical skills through workplace experience. On-boarding training is also another common type of workplace training by



Source: World Bank Enterprise Survey Bangladesh, 2013

Figure 8: Share of Firms Offering Formal Training Program for its Full-time Employees by Firm Size

employers. However, in Bangladeshi context employers are often unable to provide these workplace trainings for a variety of reasons such as lack of capacity and risk of turn-overs of trained staff[30] (Figure 8).

25. Society in Bangladesh as a whole still undervalues skills training. The society has largely failed to signal the demand for technical education and training to students and parents who often undervalue technical skills against general academic skills[31]. Employability of technical degrees has been overlooked. Though uptake of skills training has increased in recent years, the society continues to attach lower values to technical and vocational streams of education in Bangladesh. Among employers, awareness about impact and return of skills training on labor productivity remain inadequate, which is partly to blame for the low prevalence of workplace skills training. Poor social image and low awareness of skills training is a serious concern. Social value system would not be changed overnight; however, with strong positive message from the highest office of the government and a host of social interventions by the ministries, the image of skills training is gradually changing and has begun to attract more competent students into TVET.

2.2 SUPPLY-SIDE ISSUES FOR STUDENTS: EFFECTIVENESS OF SKILLS SUPPLY – POOR EMPLOYABILITY

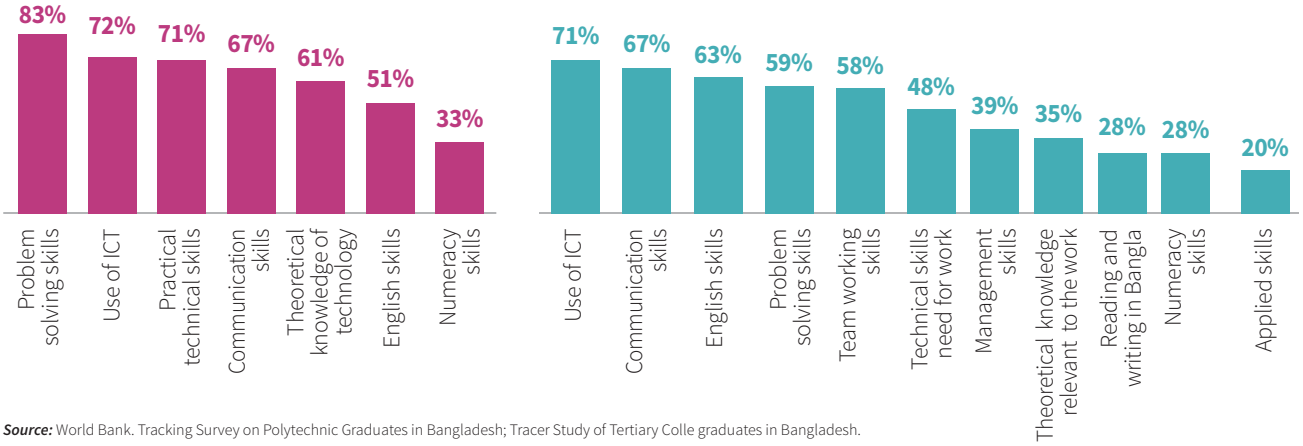
26. Employers are not satisfied with skills attributes of Bangladeshi youths to meet the needs of the current dynamic business environment, and graduates are not fully equipped to cope with fast-changing world of work. Major areas of skills gap and weaknesses of Bangladeshi youths as identified by industry leaders and are crucial to survive in fast-changing environment include, but not limited to, the following: (a) Higher-order cognitive skills and soft skills; (b) Practical technical skills and knowledge for job; (c) Information technology skills; and in some cases, (d) Foundational skills. Filling these skills gaps would improve employability of graduates and better prepare graduates for today's dynamic economy. In addition, students' skills to navigate job market would also play an important role to enhance employability.

27. Inadequate Higher-order Cognitive Skills and Soft Skills: Skills such as critical thinking skills, problem solving skills, leadership skills, communication skills, work ethics, and team work skills, are becoming essential and highly demanded by employers in the current dynamic economy, but largely missing skills among youths in Bangladesh. Consultations on skills for future jobs with industry stakeholders as well as the World Bank's skills survey report have consistently found higher-order skills such as critical thinking skills, problem solving, communication, creativity, and taking responsibility as areas where employers see most skills gap in terms of meeting their current business requirements[32]. Figure 9 below shows that the large majority of employers of polytechnic graduates and tertiary college graduates view their employees' problem-solving skills as inadequate. Communication skills for workplace, another important skill area of higher-order cognitive skills, are also seen as weakness of both polytechnic and college graduates by the majority of employers. Numeracy skills, one of the foundational skills, appear to be satisfactory to many employers. As discussed earlier, importance of higher-order cognitive skills and soft skills are to grow once their businesses start moving away from static environment with routine processes into more dynamic and technology intensive business environment. Ability to think critically and be adaptable holds a key in adapting to new environment. Workers are increasingly required to analyze issues, identify problems, and use his or her expertise flexibly to solve problems. Workers with higher-order cognitive skills and soft skills would be able to demonstrate high performance and would claim higher wages. In consultation with industry stakeholders, however, they unanimously agree that many of Bangladeshi youths including university graduates are not adequately trained and skilled in these areas.

[30] For instance, a tracer study on polytechnic graduates by the World Bank (forthcoming) found that only 14% of wage employed graduates have received on-the-job training after joining the firm. SEIP & BIDS (2017) notes that on-the-job training is a common practice in the RMG sector to provide workers with specific skills needed to complete their work. The RMG sector may have a greater incentive to provide workplace-based training due to greater exposure to the global competition.

[31] This poor perception about TVET is slowly changing, owing to aggressive public campaigns. The tracking survey on polytechnic graduates found that around 70% of polytechnic students received high marks (either A+ or A) in their secondary school completion examination.

[32] See World Bank. (2013). Responsibility, communication, and problem solving are on the top of the list of skills gaps identified by business owners. Other higher-order skills such as customer care, motivation, and creativity are also ranked high in the list.

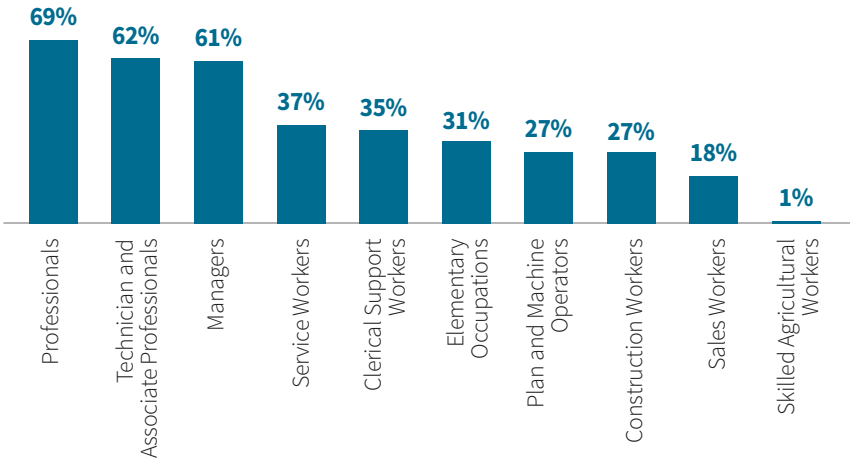


Source: World Bank. Tracking Survey on Polytechnic Graduates in Bangladesh; Tracer Study of Tertiary Colle graduates in Bangladesh.

Figure 9: Employers' view on skills areas that graduates should strengthen more

28. Inadequate Practical Technical Skills and Knowledge: For technical and engineering oriented occupations, overemphasis on theoretical knowledge at the expense of practical skills is seen as a cause for serious lapses in technical competencies which hinders effective application of new and existing technologies. This is especially the case for tertiary-level education and training in science, technology and engineering fields. University education, especially in science, technology and engineering subjects, are suffering from quality crisis, often due to outdated curriculum, lack of or poor facilities/equipment for science labs and engineering workshops, weak pedagogical skills and motivation of faculty members, lack of industry linkages[33], and lack of quality assurance mechanism. As a result, many of technical and engineering graduates from universities in Bangladesh are deprived of opportunities to develop well-balanced theoretical knowledge and practical skills which employers are seeking in their job candidates. Diploma-level TVET institutions are also facing the similar challenges in imparting practical skills. Many of diploma awarding institutions are operating with age-old facilities and equipment. Opportunities for practical skills training are in place within the curricula through a well-intended system of industry attachment; however, they are often poorly structured/implemented and not monitored for quality of training[34]. All these challenges are shown up in reported cases of difficulties of finding skilled professionals and technicians. Many employers indicate that they often experience lack of skilled applicants in those critical high-level positions (see Figure 10 below).

29. Inadequate ICT Skills Development: Graduates must be more conversant in information technologies to fully exploit the growth potential of new technologies, and to explore job opportunities in the booming ICT industry in Bangladesh. Many of productivity-enhancing technologies in manufacturing and

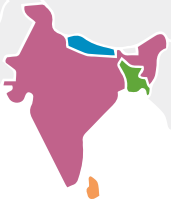


Source: World Bank (2016). Skills for Decent Employment

Figure 10: Reported lack of skilled applicants across occupations by employers (%)

[33] Quality and relevance challenges in universities are documented in the World Bank's Skills for Growth report. The World Bank has been supporting the university sector to improve teaching and learning through Academic Innovation Fund initiative under the Higher Education Quality Enhancement Project (HEQEP) (see Annex X).

[34] The World Bank-funded Skills and Training Enhancement Project (STEP) has been supporting polytechnic institutions through various institutional improvement activities for teaching and learning as well as industry partnership, and through innovative approaches to enhanced industry attachment program.



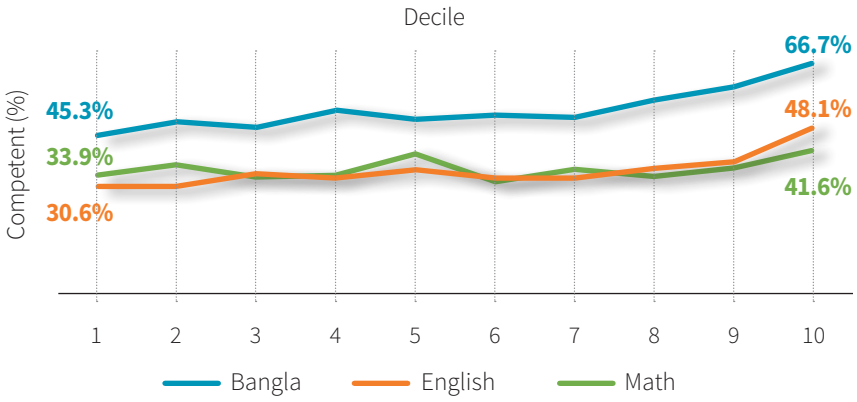
NEPAL	INDIA	SRI LANKA	BANGLADESH
118 Networked Readiness Index	**89** Networked Readiness Index	**65** Networked Readiness Index	**109** Networked Readiness Index
117 Skills Index (ICT use capacity)	**102** Skills Index (ICT use capacity)	**30** Skills Index (ICT use capacity)	**125** Skills Index (ICT use capacity)

Source: World Economic Forum (2015).

Table 1: Bangladesh lags other South Asia countries at leveraging ICT

service sectors come with advanced information technologies such as Computer Assisted Design (CAD) system or Computer Numerical Control (CNC) machines in the case of manufacturing. Information technologies are becoming ubiquitous presence at today's workplace in Bangladesh. It is evident that significantly more ICT skills are needed to meet domestic business needs. Employers are, however, not satisfied with their employees' ICT skill and wanting to see technical workers to be better skilled in ICT (Figure 9). Furthermore, the ICT industry itself appear to grow as a source of employment and self-employment at an accelerated pace in Bangladesh. For instance, Bangladesh is now believed to host more than 500,000 on-line freelancers who collectively earned US$20 million in 2013 mostly from works originated from abroad[35]. Bangladesh has also been attracting the world's attention as a fast-growing destination of Business Process Outsourcing (BPO). For the first time, it was ranked at the 22nd in the A.T. Kearney's Global Service Location Index in 2016, in which India occupies the 1st place. Much of Bangladesh's attractiveness is currently coming from its cheap costs. A large scope remains to move up the BPO ranking through greater availability of skills and improved business environment. On the other hand, relative to other countries, Bangladesh still has a long way to go to enhance ICT capacity among youths and workers. Bangladesh ranked 125 out of 143 economies in terms of the skills and capacity of the population to make effective use of ICTs (see Table 1). Moreover, only 40% of managers, professionals, and clerical workers are reported to use computers regularly at workplace[36].

30. Poor Foundations for Skills Development: Poor foundational skills development in basic education poses considerable challenges for effective skills acquisition in higher cognitive and technical skills. Due to poor quality and relevance of education in primary and secondary education, foundational skills – literacy and numeracy – which are the basis for other high-level cognitive and job-relevant technical skills often remain inadequate even among those entering post-secondary education[37]. Employers are found to be often



Source: LASI 2013, as quoted in Program Appraisal Document for Transforming Secondary Education for Results

Figure 11: Share of Grade 8 students meeting grade-level competency standards, by wealth groups 2013

[35] It was reported that more than 650,000 Bangladeshis were registered on the Upwork website for freelancers, according to an article, "IT Freelancing Grows in Bangladesh". https://www.voanews.com/a/it-freelancing-grows-in-bangladesh/3264214.html.

[36] According to World Bank (2013), use of computers may be low in Bangladesh. Having skills may not be equivalent to applying skills to productive use. In line with this argument, a recent OECD report on adult skills survey, Skills Matter: Further Results from the Survey of Adult Skills, argues that use of skills in the labor force should be measured separately from acquisition of the skills so as to capture the impact of skills on growth. Some economies are found to have a high level of problem solving skills among workforce but just a mediocre level of frequency of actually using such skills at work.

[37] World Development Report 2018 highlights that the 21st century skills work best in conjunction with solid foundational skills, and higher-order cognitive skills and technical skills can only be built on a strong foundation.

unsatisfied with literacy and numeracy skills of their workers[38]. According to the national student learning assessment at secondary education level (Learning Assessment of Secondary Institutions: LASI 2013), only around 51 percent of Grade 8 students meet the grade equivalent competency standard in Bangla subject, and they are faring even worse in English and Math subjects. Even among richer students, less than half are adequately competent in English and Math (Figure 11). In many cases, secondary school teachers in turn lament about low academic competencies and readiness of new entrants in Grade 6. Weak foundational cognitive skills due to deteriorating education quality at primary and secondary education are seriously undermining the effectiveness of skills development at later stages of education and training. Annex 6 summarizes skills development challenges in basic education. Opportunities for remedial education and second chance education to retrain foundational skills are scarce for students who left formal schooling system. Few post-secondary institutions offer remedial courses for students to strengthen their foundational cognitive skills.

31. Poor Job Market Skills: Both job seekers and education institutions in Bangladesh are weak in job search skills and job placement capacity, and tend to have unrealistic expectations about their job prospects and skills requirements. It has been reported by job market operators during the consultation session for this study that graduates and teachers are often found to have unrealistic expectations about the current industries and business environment, and have limited understanding about qualifications and required skills in the job market. This is a good indication that students and parents[39] have never been trained and are lacking in important job search skills and career development skills in general. Exacerbated by the lack of access to job market information, this would make educational choices and navigating the complex job markets even more challenging, and create unnecessarily large frictions in the job markets which would lead to young job seekers wasting extended period of time in re-building skills or searching for jobs[40].

2.3 SUPPLY-SIDE ISSUES FOR WORKERS: SHORTAGE OF SKILLS TRAINING OPPORTUNITIES FOR WORKERS IN BANGLADESH

32. Coping with fast-changing business and technologies means that workers should be able to access continuous learning and re-learning opportunities whenever new skills requirement presents itself. The current landscape of skills supply in Bangladesh may not be conducive to meeting such sustained constant skills upgrading needs. This section touches upon some of the supply issues surrounding workers in the labor force in Bangladesh.

33. Unequitable Access for Females and Poor: Overall, there's a significant shortfall of skills development opportunities especially among females and the poor. In Bangladesh, primary education is now almost universal, secondary education has been expanding rapidly, and tertiary enrollment has gone up from 2.6 million to 4.4 million students by 2015[41]. However, the share of tertiary degree holders is still not adequate (only 4.2 percent of working-age population). Access to skills training opportunities has been increasing but still fall far short of meeting the demand. Skills training are particularly difficult to access for female workers and poorer groups of the labor force. Females have traditionally been underrepresented in skills development especially at higher levels of education and after joining the workforce. For instance, the share of female students in tertiary education is only 38 percent, and that in universities stands at just 33 percent as of 2016[42]. In the workforce, the ratio for female of having received skills training is only about half of that for male[43]. Much fewer numbers of females are enrolled in vocational and technical education, though the

[38] According to World Bank. (2013). Overall, employers identified literacy and numeracy as areas of large skills gap among their employees.

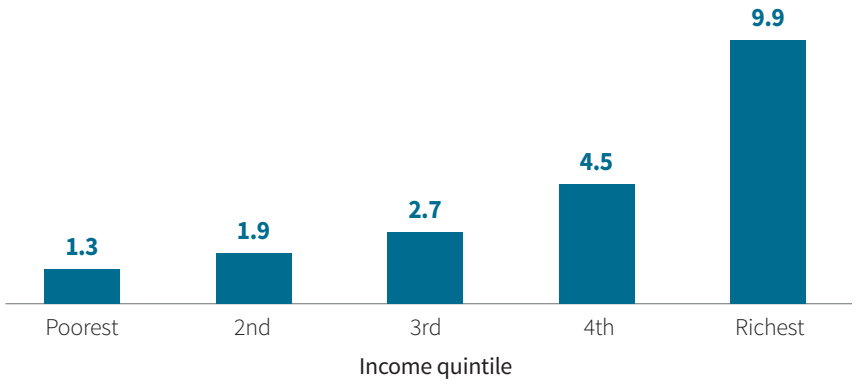
[39] Many of parents of TVET and tertiary education graduates do not possess the same sort of experience in searching for formal/wage jobs. Nearly half of the fathers of polytechnic students, for instance, work in agriculture and have primary education qualification or less, as found in World Bank's tracking survey on polytechnic graduates.

[40] This type of unemployment can be categorized as transitional unemployment or frictional unemployment. Unemployment inevitably occur when people move from school to work, one work to another, or work to school. A certain level of transitional unemployment is normal and healthy. Efficient friction-less job markets can minimize the extent of transitional unemployment. However, when economies are under major transitions, job market frictions tend to grow as outdated job market mechanics are re-shaped and people's behavior are adjusted. Some researchers point out the importance of establishing well-functioning job market for unlocking the full potential in emerging economies. See, for instance, Jain & Sarda (2014).

[41] Including enrollment in universities, tertiary-level colleges and post-secondary TVET institutions.

[42] More detailed analysis will be provided in the forthcoming study, Skills for Growth in Bangladesh. There is a gender parity in secondary education in Bangladesh; however, the gender gap in enrollment starts to appear at the level of higher secondary school and grows wider in tertiary education.

[43] According to the Bangladesh Labour Force Survye 2015/16.



Source: Bangladesh Jobs Diagnostics, 2017
Note: Income quintile is based on the proxy means test score

Figure 12: Share of Workers Having Skills Training in the Past 12 Months, by income quintile

share has been gradually on the rise. Only 27 percent and 14 percent of vocational stream secondary students and polytechnic students, respectively, are female in 2016 according to the government statistics. More skills development opportunities catered and tailored to female workers' demands are needed. Poorer segments of the labor force have much lower exposure to skills training (Figure 12). Tertiary education enrollment is also highly skewed towards richer groups, especially in the richest income quintile[44]. Equitable access to skills development opportunities need to be further enhanced.

34. Shortage of Management Skills: Good mid-level managers who can steer operations in changing business environment are hard to find among Bangladeshi workers across the board. Business owners often run into a significant difficulty in finding good managers in Bangladesh, such as supervisors with sound skills in production process management, quality control, project management, etc. (see Figure 10 above). It is much harder than finding production-line workers. Therefore, business owners are often forced to fill manager positions with foreign professionals from South Asian/East Asian countries. This quick-fix, however, has led to significant amounts of hard-earned foreign currency getting siphoned off again to abroad every year[45]. This in one way appears to be a teething pain for Bangladesh. Managers with management expertise and experience do not grow out of training mills. They have to be properly trained by experts and groomed in-situ for years. As Bangladesh's manufacturing sector is still relatively young, time will help to some extent to produce more managers down the line. Nonetheless, it is evident that Bangladesh have to do much more to train and groom a large pool of mid-level managers who are capable of handling modern industrial management methodologies and tools.

35. Low Skilled Migrant Workers: International migration poses unique skills challenges as skills levels of migrant workers have been slow to improve. International migration has been one of the major sources of employment and income for many Bangladeshi workers. In 2016 alone, Bangladeshi migrant workers remitted a total of around US$15 billion back to the country[46]. Overseas employment among Bangladeshis has increased drastically. Data shows that more than 750,000 Bangladeshi workers (among whom 16 percent were female) left the country as migrant workers in 2016, a considerable increase from around 380,000 workers 10 years earlier. However, in terms of skills composition, less skilled workers still constitute the largest share. Around 56 percent of Bangladeshi migrant workers are classified as either unskilled or semi-skilled in 2016. The share of 'skilled' workers among expatriates has been hovering in the range of 30-40 percent over the past decade, despite the various efforts to raise skills attainment of Bangladeshi migrant workers. Upskilling of migrant workers would contribute to improving job qualities. Recognizing and certifying their hard-earned job skills would also be important.

36. Lack of Skills Training for Informal Workers: Informal sector has been severely underserved in skills development agenda. Despite the fact that informal sector yet accounts for around 86 percent of employment in Bangladesh[47] and contributes around 40 percent of the total value added of the economy, it has largely escaped the attention of the skills development circle and little training opportunities have been made available to them. Unsurprisingly, less educated the

[44] According to the World Bank (forthcoming): Skills for Growth in Bangladesh.

[45] In 2014, according to Bangladesh Bank, around US$4 billion a year was repatriated by foreign professionals, mostly working in RMG industry, as salaries, allowances, and various fees.

[46] According to data from Bangladesh Bank.

[47] According to the 2015 Labour Force Survey, the breakdown of informal employment across economic sectors in Bangladesh is Agriculture (49%); Industry (21%); and Service (30%). Within sectors, 98%, 90%, and 71% of employment in Agriculture, Industry, and Service sectors, respectively, are in the informal sector.

workers are, more likely they are to be employed in the informal sector Small and Medium-size Enterprises (SMEs). More than 90 percent of workers with primary education or less are informal sector employees, while one third of higher secondary graduates and nearly half of tertiary graduates are formally employed. Partly because of these gaps, low labor productivity has been a hallmark of the informal sector. Labor productivity in the formal sector is estimated to be six-time larger than that of the informal sector[48]. Skills training in the informal sector has several important challenges. There's a dearth of evidence about this sector, including skills training needs. Many of informal sector employees are poorly educated thus have weak foundational cognitive skills. Formal training institutions are not well positioned to respond to the needs of informal economy[49]. Informal sector workers learn most of skills through informal workplace apprenticeships where they acquire skills from other low- or semi-skilled craftsmen, and never receive any formal certification for their hard-earned skills[50]. Upskilling of the informally employed workers would be an essential strategy to translate skills development into more inclusive economic growth and mass-based poverty reduction.

2.4 DISCONNECTS AND INSTITUTIONAL CAPACITY CONSTRAINTS IN SKILLS ECOSYSTEM

37. Linkages with industries, employers, and job market are the single most important element in creating a functional skills development ecosystem. Education and training institutions should also be able to reflect information from the industries and job market in their education and training contents and practices.

38. Lack of Updated Labor Market Information: Job market information is far from adequate and not well connected with job seekers and skills providers. Job market information about what jobs and skills/experiences are demanded is largely missing in Bangladesh. Bangladesh Bureau of Statistics maintains Labour Market Information System (LMIS) based on periodic nation-wide labor market surveys. Detailed and regular analysis of such cross-sectoral data from a nationally representative sample offer comprehensive snapshots of employment and unemployment and indicate key labor market trends in Bangladesh. However, information and implication about skills needs and job market situation are not available in the LMIS. Such job market and skills demand data in different industries if provided regularly would immensely help policy makers, education/training authorities, schools and institutions, and job seekers to make right decisions about skills training and acquisition[51]. Young job seekers tend to have limited and biased information about what jobs are available and what skills are needed for them. On-line job market platforms appear promising but are still limited in terms of coverage and job search support service available.

39. Weak Industry Collaboration and Participation: Education and training systems in Bangladesh have been slow in developing effective partnerships with industries. Industry is the final consumer of supplied skills and employer of students coming out of education system. Collaboration with industries is essential for skills development system to deliver quality and relevant learning experience to students, especially to keep up with new technologies that are brought into use in industries. Until recently, only a select few institutions of universities and polytechnics in Bangladesh had formal industry partnerships or collaboration. Activities which support delivery of more structured and relevant training such as curriculum training and teacher training occurred only on a limited scale. School-level industry collaboration mechanisms are largely absent except in some universities and polytechnic institutions. Colleges have little, if any, interaction with industries. The government's support for incentivizing industries to engage in skills training have been ad-hoc and yet to be institutionalized in permanent forms

[48] According to ADB & BBS (2010).

[49] World Bank (2007) argues that re-orienting formal training system to meet skills training needs of informal sector would be unrealistic and not reasonable solution, and argues for greater partnership with non-governmental actors to expand training services for workers in the informal sector.

[50] ILO (2009) has conducted a thorough review of formal and informal apprenticeship programs in Bangladesh. It argues that apprenticeship is a main method of imparting skills in informal settings; however, informal apprenticeship is based on employment needs of businesses and personal relationships, and tend to offer lower quality training without certification and have poorer working conditions.

[51] Sporadic cases of individual projects having conducted skills surveys in Bangladesh would offer good insights: For instance, Islamic Development Bank conducted a technical skill needs survey in ICT industry (http://www.idb-bisew.org/index.php?option=com_content&view=article&id=243&Itemid=134). Other cross-sectoral skills surveys have been undertaken by the World Bank (2013) and ILO (2012).

such as tax exemption. The central agencies of higher education are yet to establish bodies for promoting industry collaborations. In skills development sector, National Skills Development Council (NSDC) has been formed as an apex body of coordination of all the skills training initiatives and stakeholders including both public and private entities. To mobilize industry participation, the Industry Skills Councils (ISCs) have been established with ambitious goals as an industry-driven platform for skills development. By 2017, a total of 12 ISCs have been established by relevant industry representatives with the help of various skills development projects. Each ISC is a coalition of relevant industry associations and key enterprises of the industry. The objectives of ISCs include, but not limited to, facilitating industry-institution collaboration in enhancing quality and access of skills training, providing skills training to unemployed workers, developing industry competency standards, and producing knowledge about skills demands in the industry. These facilitator functions that ISCs are expected to play would be critically important for ensuring responsiveness of skills development system to adapt to fast-changing skills demands of industries. However, the overall efficacy of NSDC system is yet to be fully materialized to the level that was envisioned due to shortage of resources and capacity constraints, while the ISC system is still rather weak in their institutional capacity and lacks the coherent mechanism for sustainability. Maintaining commitment and securing contributions from industry stakeholders have also been a major challenge for the ISCs.

40. Inadequate Capacity for Flexible Curriculum Revision and Student Assessment: Curriculum updating are not adequately adaptive due to the centralized control, overreliance on written examination is a long-standing issue. Universities enjoy a full autonomy over its education contents. Curriculum for tertiary colleges and vocational training institutions, on the other hand, are centrally controlled by the respective central agencies. Capacity of the central agencies to flexibly update and ensure quality and relevant curriculum need to be further strengthened. There is a strong culture of written examinations, which relies excessively on the memorization of knowledge. The issue is of a particularly serious concern in tertiary colleges[52].

41. Inadequate Capacity for Delivering Quality Teaching: Quality teaching and learning becomes challenging with inadequate provision of modern learning facilities and insufficient teacher training opportunities in the education and skills training institutes. Most education and training institutes in Bangladesh have limited development funds to improve teaching learning facilities and provide necessary professional development opportunities for teachers. This leads them to operate without adequate teaching aids, modern labs, equipment and ICT facilities needed for conducive teaching learning environment[53]. Especially in the provision of science, technology and engineering subjects, practical learning is hampered when students have little or no access to raw materials and lab facilities. At technical institutes, the lack of modern facilities and equipment for training is considered to hinder technical graduates' competency and familiarity with modern machineries and tools needed for today's industry jobs. Teachers, including at universities, are often deprived of appropriate training to enhance their modern pedagogical skills due to the lack of professional development opportunities and clear understanding about teachers' desired competencies.

42. Over the past years, education and technical institutes, including universities and polytechnics, have been able to acquire some modern equipment and offer some teacher trainings to support practical learning under different government development projects, such as Skills and Training Enhancement Project (STEP) and Higher Education Quality Enhancement Project (HEQEP). However, there still is a long way to go to ensure the availability of modern facilities and teaching skills at institutions to provide relevant learning for new and current technologies.

43. Inadequate Implementation Capacity and Resources for Quality Assurance: Quality assurance is still a relatively new concept in education and skills development sectors of Bangladesh, and the implementation of policy framework remain weak. Each subsector has its own quality assurance mechanism. The higher education sector has recently enacted Accreditation Council, Bangladesh (ACB) Act in 2017 which lays the foundation for ensuring quality education delivery in the higher education institutions, including public and private universities and tertiary colleges. Under the ACB Act, an Accreditation Council is in the process of establishment. The ACB

[52] More in-depth analysis about institutional capacity for improving quality and relevance of education in tertiary education institutions will be available in the upcoming study, Skills for Growth in Bangladesh.

[53] See the World Bank's education sector review, Bangladesh Education Sector Review: Seeding Fertile Ground: Education That Works for Bangladesh, for detailed description of challenging teaching and learning environment at education and training institutions.

will be an independent autonomous body responsible for overseeing the quality of higher education delivered at the institutions and assess it against the benchmark given in the National Qualifications Framework. It would receive applications for accreditation of programs at the initial stage and later, institutions, and conduct external assessments of the quality of teaching and learning in the higher education institutions. The ACB is also assigned to support the Institutional Quality Assurance Cell (IQAC) at all universities through the development of standards, guidelines and code of good practices and assist to develop their own procedures, techniques and modalities for self-assessment. In TVET, a National Skills Quality Assurance System (NSQAS) was established under the National Skills Development Policy 2011 as a regulatory framework for quality assurance across the subsector. The NSQAS is a comprehensive system covering all entities engaged in the acquisition of skills, including graduates, teachers, training courses, workplaces, training organizations and industry. The NSQAS includes: (a) accreditation of nationally recognized units of competency, qualifications and course specifications; (b) registration of public and private training providers; (c) accreditation of learning and assessment programs leading to nationally recognized units of competency and qualifications; (d) auditing of training providers for compliance against quality standards; and (e) validation of assessment tools against units of competency. However, the implementation of these policy frameworks has been a challenge. The ACB is still premature to make much of a dent in the system, although some IQACs show encouraging results from their institutional-level activities. The competency standards under the National Technical and Vocational Qualification Framework (NTVQF) are yet to be officially implemented in most of public and private training institutions due to technical and financial resource constraints. These quality assurance mechanisms need to be further strengthened and continually updated to remain relevant with the fast-changing skills demands.

3 SKILLS STRATEGIES FOR JOB FOR BANGLADESH: HOW BANGLADESH CAN MEET SKILLS DEMANDS FOR A NEW ERA OF WORK AND TECHNOLOGY

44. Building on discussion in the preceding chapters, this chapter discusses and recommends a range of policy options both from the demand and supply sides of skills for enhancing skills development system in Bangladesh in the age of dynamic economy. Pillar 1 discusses possible measures to strengthen linkages between demand and supply of skills, whereas Pillar 2 comprises of approaches to enhancing and reorienting skills supply to overcome skills challenges in light of changing and unpredictable skills demand. Finally, Pillar 3 discusses policy measures to foster greater participation of demand-side – private industries – in skills development. Each recommendation is complemented with tentative short-term and mid- to long-term priority policy actions and results.

3.1 PILLAR 1: IMPROVING INSTITUTIONAL CAPACITY FOR BETTER LINKAGE BETWEEN SUPPLY AND DEMAND SIDES OF SKILLS TOWARDS MORE ADAPTIVE SKILLS DEVELOPMENT SYSTEM

45. When the economy evolves fast, it is crucial for skills development system to have as seamless linkages as possible between the demand and supply sides of skills to ensure the industries get skilled manpower they need to make the most out of the business environment and latest productivity enhancing technologies.

Labor Market Information and Responsiveness

46. Strengthen labor market information and graduates feedback system to enable evidence-based planning and to inform institutions and individuals:

Availability of timely labor market information (i.e. employment opportunities, human resource and skills needs of key industries) should be strengthened as a basis for evidence based planning for skills development and to inform training institutions and trainees about employment prospects in key occupations[54]. ISCs and industry associations under the guidance of National Skills Development Council (NSDC), can play a leading role in undertaking skills surveys, such as national or industry-wide employer skills survey, and formulating action plans to fill skills gap in respective industries. It is crucial that each industry maps out their current and anticipated skills demand and gap if any to mitigate skills bottlenecks in the industry. ICT can play a major role in establishing efficient labor market and skills information system and timely dissemination. Job market can be made more efficient with digital tools. Online job portals should be enhanced through public and private platforms to enrich job market information to reduce matching problems and job search frictions. Some of the priority policy actions and results in short-term and mid-term include the following.

Short-term actions	Mid- to Long-term results	Agencies Responsible
• Conduct job market analysis for skills demand in selected industries • Strengthen labor market information system (LMIS) • Support on-line job portal platforms to improve coverage and usability • Disseminate job market information to post-secondary stakeholders	• LMIS regularly updated with expanded coverage and information • Labor market surveys regularly conducted in different productive sectors • New course opening and curriculum design for education and training institutions are informed regularly by job market surveys and LMIS	MoEWOE, MoLE, MoE, NSDC

47. Increase labor market responsiveness of post-secondary education:

The education and training system should be held accountable for labor market relevance of their service and employability of their graduates; System for regular tracking of graduates is needed both at central and institutional levels. Concerns over employability of tertiary education graduates are mounting in Bangladesh[55]. Tertiary education and skills development sectors should institutionalize a mechanism to monitor the labor market outcomes of their recent graduates and receive feedbacks from employers about skills gap of graduates[56]. Establishing effective labor market feedback systems, such as graduates tracking and regular consultation with employers and alumni, are indispensable for adjusting education and training contents to the changing skills needs of industries[57] Traditionally, however, Bangladesh education system has not had a culture of tracking students beyond their graduation[58].

[54] Strategic Plan for Higher Education in Bangladesh 2017-2030 urges MOE/UGC to carry out labor market studies to identify human resource needs and review university curricula on a regular basis (MOE, 2017). National Skills Development Policy (NSDP) 2011 also places a strong emphasis on the needs of developing a robust skills database system for planning and monitoring (MOE, 2011).

[55] Graduate unemployment has been a major concern among higher education stakeholders. See, for instance, an article "Tackling Graduate Unemployment". http://www.thedailystar.net/tackling-graduate-unemployment-the-need-for-university-industry-cooperation-3097. This issue came to the society's attention especially strongly when the statistics came out to show high unemployment rates among tertiary education graduates. See, for instance, an article, "Job Opportunity: Higher degree, lesser scope". http://www.thedailystar.net/frontpage/job-opportunity-higher-degree-lesser-scope-1412233.

[56] For instance, Strategic Plan for Higher Education in Bangladesh, recognizing long-standing frustration of employers about poor relevance of university education, strongly urges universities to establish (a) a proactive and well defined system of linkage with employers and industry stakeholders, and (b) regular contact with employers to reflect changing standards in curricula, so that university education in Bangladesh will be nationally and globally competitive.

[57] World Bank (2002) argues that new roles of universities in the knowledge society shift from an emphasis on teaching to a focus on students learning and career choices, for which effective beneficiary assessment and labor market feedbacks are important instruments.

[58] For instance, most recently completed tracer study in TVET is 10 years old, done by World Bank (2007) until the World Bank conducted a tracer study on short-course graduates in 2014 (Nomura et al., 2014). Tracer studies are currently underway that track graduates from polytechnics, universities, and colleges by the World Bank. Collectively these studies will give a holistic picture of employment outcomes of post-secondary graduates.

Paucity of follow-up information on graduates makes it difficult for policy makers and institutions to systematically assess how closely their curriculum are aligned with employers' human resource needs. Central agencies of TVET and higher education, such as UGC, DSHE, DTE, and National University, should have a policy framework and operational capacity to conduct regular graduates tracking and establish databases for dissemination about graduates' employment or further education outcomes. Undertaking graduate tracking will also help individual institutions to adjust their teaching and career support strategies. Until today, except for some universities recently piloting to track students, most of institutions are yet to establish graduate tracking systems. With near universal mobile phone and email use among Bangladeshi youth, digital communication will help substantially reduce the cost of establishing communication with graduates. Right incentive mechanism should be put in place for public institutions to be rewarded for setting up tracking system and achieving higher employment rate of graduates. Some of the priority policy actions and results in short-term and mid-term include the following.

Short-term actions	Mid- to Long-term results	Agencies Responsible
• Conduct nation-wide tracer studies on graduates • Develop institutions' capacity to conduct tracer study and employer surveys	• Periodic nation-wide tracking surveys institutionalized • Post-secondary institutions regularly updated about graduates situation and local labor market needs	UGC, DSHE, DTE, NU, universities, colleges

Institutional Strengthening for Sector-wide Collaboration and Quality Assurance

48. Strengthen central planning and collaboration facilities for skills development.

Strategic planning for skills development should be strengthened. National Skills Development Policy (NSDP) 2011 has been a guiding policy for TVET sector, and the time appears ripe for it to be reviewed and updated/upgraded to incorporate lessons learned and new requirements in skills development. Collaboration and monitoring at the national level for harmonized skills development need to be further improved, involving all concerned ministries, private sector, and development partners. Industry Skills Councils (ISCs) should be further strengthened and engaged. The government's on-going initiative of establishing and operationalizing the National Skills Development Authority (NSDA) and National Human Development Fund (NHDF) and strengthening NSDC should be pursued with a renewed vigor. Based on these facilities and wider stakeholder consultation, planning and coordination for skills development should adopt more sector-wide program approach.

Short-term actions	Mid- to Long-term results	Agencies Responsible
• Establish a national statutory body for planning and collaboration, including private sector • Enhance ISCs activities and sustainability for greater private sector participation • Initiate sector-wide annual and five-year results-based planning system for skills and higher education sectors • Strengthen monitoring capability for skills development	• NSDA, NSDC, NHDF are operationalized • Sector-wide planning system functional under the national coordination body • ISCs are regularized with stable revenue • Implementation progress regularly monitored	MoE, MoLE, NSDA, NSDC, ISCs, relevant line ministries

49. Speed up the implementation of qualification framework and quality assurance system.

Higher education and skills development sectors both have or will soon have laid a good foundation in recent years for qualification framework and quality assurance system as discussed earlier. The implementation of these policy initiatives needs to be expedited and sustained. Competency standards in the national skills qualification framework have been expanded; however, only a handful of training institutions have so far been able to offer programs that adhere to those competency standards and are eligible for assessment and certification. The central skills agency for accreditation and skills certification is in urgent need of substantial capacity improvement and international recognition. The Bangladesh Accreditation Council (BAC) for higher education is still at a nascent stage and will have to initiate the accreditation process. The quality assurance activities in universities need to be fully institutionalized and more deeply integrated within the mandate of the institutions.

Short-term actions	Mid- to Long-term results	Agencies Responsible
• Expand the implementation of skills qualification framework as a mandatory requirement for all skills training institutes • Upgrade technical education board as skills accreditation and certification agency • Prepare and update all competency standards in collaboration with industries • Implement accreditation of higher education institutions • Expand quality assurance activities at national and institution levels	• The skills qualification framework is fully implemented and regularly updated • The accreditation of higher education is regularized and enforced rigorously • Quality assurance activities are institutionalized Qualification frameworks, accreditation system, and quality assurance system are internationally recognized	MoE, UGC, DSHE, BAC, BTEB, universities, colleges, TVET institutes

3.2 PILLAR 2: RE-ORIENTING SKILLS SUPPLY TO PREPARE YOUTHS FOR UNPREDICTABLE SKILLS DEMAND AND UNCERTAIN ECONOMIC ENVIRONMENT

50. How to provide relevant skills development has always been a challenge for Bangladesh. Now with changing technologies and business environment, technical skills needed for jobs are increasingly becoming elusive and unpredictable. This sub-chapter discusses some of promising policy options to enable the country to cope with these new challenges to make the best out of the opportunities presented by technological advances.

3.2.1 SKILLING UP STUDENTS

Enhancing Higher-order Thinking Skills and Soft Skills Development in Post-Secondary Education

51. Train Higher-order Cognitive Skills and Soft Skills in Post-Secondary Education:

Education/training programs should integrate training components and pedagogical approach for developing higher-order cognitive skills and soft skills. Higher-order cognitive skills and soft skills are highly demanded in modern workplaces. Graduates who demonstrate sound higher-order cognitive skills and soft skills at job interviews and workplace are expected to earn higher wages. Special training courses, usually highly immersive and interactive, dedicated to fostering those skills can be designed and implemented in post-secondary institutions as additional training programs for students. These skills can and should also be nurtured in daily classroom education. These skills should be incorporated in curriculum and qualification framework as expected learning outcomes and competencies. Moreover, it is known that introducing Active Learning methods would be highly conducive to nurturing higher-cognitive skills and soft skills even at post-secondary institutions. Collaborative and project-based learning would immerse students in active group works where they experience dynamic analytical and problem solving activities. Teachers should be trained on such pedagogy/andragogy skills. For more details on good practices of skills development initiatives for higher-cognitive skills and soft skills, refer to Annex 1.

Short-term actions	Mid- to Long-term results	Agencies Responsible
• Design methods for training higher-order cognitive and soft skills • Pilot new courses at selected institutions	• Pedagogical methods and teaching contents to nurture higher-order cognitive skills adopted in curriculum	UGC, DSHE, DTE, BTEB, universities, TVET institutes

52. Assess Students Higher-Order Cognitive and Soft Skills in Post-Secondary Education:

Measuring students' higher-order cognitive and non-cognitive skills as well as technical skills is the first step towards improving teaching and learning and ultimately education outcomes. Embarking on quality enhancement of teaching and learning to accelerate students' higher-order cognitive and non-cognitive skills development, one major hurdle is the lack of reliable assessment on those skills of students. It is impractical to aim to improve anything without measuring its outputs and outcomes. Institutions' own semester-wise examinations do little good in terms of measuring higher-order cognitive skills and non-cognitive skills of students. Institutions and central authority should test out and institutionalize student assessment in post-secondary education on technical skills, higher-order cognitive skills, and non-cognitive skills so as to benchmark their education outcomes and measure improvement overtime. Students will be given feedbacks on how well they performed, and teachers will be given opportunities for review and advices on their teaching strategies.

Short-term actions	Mid- to Long-term results	Agencies Responsible
• Pilot student assessment on higher-order cognitive skills, non-cognitive skills and technical skills in engineering courses	• Periodic student assessment conducted • Results utilized to improve teaching and learning	UGC, DSHE, DTE, BTEB, universities, TVET institutes

53. Ensure Solid Foundational Skills among Post-Secondary Students:

Many of post-secondary students would benefit from remedial programs to retrain their literacy and numeracy skills. As discussed in the previous chapter, some students are completing basic education with shaky foundational skills. Higher-order cognitive skills and technical skills can only be nurtured building on a solid foundation. To ensure all students have adequate literacy and numeracy skills for post-secondary education and training, post-secondary institutions and faculty should establish a mechanism to offer additional remedial classes to first-year students during the first semester if they are found to have inadequate basic academic skills.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Assess foundational skills of students • Pilot remedial courses in selected institutions	• Remedial courses institutionalized as per the needs of students	UGC, DSHE, DTE, universities, polytechnics

Re-prioritizing Technical Skills Development in Post-Secondary Education

54.Expand Training in ICT in Post-Secondary Education:

Skills training in ICT should be further accelerated to enhance workplace productivity and for creation of ICT-enabled jobs. ICT have a new reality in every workplace. Students should be adequately conversant with use of ICTs. Investment in ICT should be further accelerated in skills institutions and universities/colleges to make ICT integral part of education/training processes so graduates would enter labor market with adequate foundational ICT skills. For more details on good practices in ICT skills development, refer to Annex 2.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Expand ICT facilities at post-secondary institutions • Train teachers in using ICT in pedagogy	• ICT-enhanced learning institutionalized	UGC, DSHE, DTE, universities, colleges, polytechnics

55. Make STEM More Practical and Hands-on in Post-Secondary Education:

STEM education and training with focus on practical skills should be strengthened across education cycles particularly at the tertiary education level. Overemphasis on theoretical knowledge has been taking a toll on development of desirable technical skills in Bangladesh. Greater emphasis on fostering practical and hands-on skills should be built into STEM education and training. TVET and higher education institutions must be better equipped at workshops and science laboratories and train teachers in pedagogy/andragogy skills to improve practical skills acquisition. Curriculum need to be constantly upgraded to remain relevant to latest technologies in the industries. For students in TVET and STEM, workplace exposure through apprenticeship in relevant industries would be especially beneficial for development of practical skills. Currently vocational stream of secondary education and polytechnics have industry attachment programs in their standard curriculum. However, quality of industry attachment is often questionable, and needs to be enhanced through better incentive for industry partners and future employers. Opportunities of apprenticeship should also be fully explored at higher education institutions, especially in STEM subjects. University students across the world are conducting internship. Students in Bangladesh are also taking up this trend. Through the government incentives to employers particularly in industries and occupations with skills shortage, internships for higher education students in STEM should be further cultivated.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Redesign curriculum of STEM to be more practical and hands-on • Train teachers in practical STEM pedagogy	• Practical STEM classes integrated in all STEM courses	UGC, DSHE, BTEB, universities, polytechnics

Capacity Development of Teachers, Institutions, and Students for Better Employability

56. Train Pedagogical Skills of Post-Secondary Teachers to Meet New Skills Requirements:

All those reforms discussed above require teachers in post-secondary institutions to have a new set of teaching competencies. Competencies in pedagogical skills are essential, particularly in skills to deliver Active Learning methods which is known to have positive impact on students' higher-order cognitive skills. There has been a growing recognition and consensus among university stakeholders and TVET stakeholders in Bangladesh about importance of pedagogical trainings for university faculty and skills trainers. The Higher Education Strategic Plan makes a specific case and argument for establishing a teacher training system for university faculty members. Teachers in TVET institutions and National University affiliated colleges have been benefiting from teacher training programs in the on-going projects. Teacher training opportunities need to be expanded and enhanced in future to enable teachers to redesign their teaching around the objective of training higher-order cognitive skills, soft skills, practical technical skills, and ICT skills.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Conduct situation analysis • Establish teacher training centers and programs for post-secondary teachers • Design teacher training curriculum to support active learning and practical pedagogy • Train teachers for enhanced pedagogical skills	• Teachers in post-secondary institutions exposed to teacher training on enhanced pedagogical skills	UGC, DSHE, BTEB, universities, polytechnics

57. Upgrade Teaching and Learning Environment of Post-Secondary Institutions:

Capacity of institutions to support effective and flexible learning practices needs to be upgraded in particular through revamping their often dilapidated facilities and outdated equipment at universities, colleges, and polytechnics. Demand for facility renovation is huge and equipment in post-secondary education are often costly. Under the tight fiscal space of the public sector, institutions must be able to make smart investment in their teaching and learning environment, and the central agencies need to be able to identify institutions where return on investment would be high. Innovative performance-based institutional grant system has been tested in university, college, and polytechnic sectors by the respective development projects. Under the scheme, institutions are required to formulate institutional development plans for the mid-term span, taking accounts of all the priority needs of the institution. The plans will then be vetted by the central agency and approved for grant awards, which would be followed by rigorous monitoring. In the university sector, the quality assurance system mandates universities to conduct extensive self-assessment and prepare institutional plans for improvement. These facilities would offer a promising platform for extending smart and efficient investment for teaching and learning environment in a transparent and accountable manner, and should be expanded to channel more funding to providing essential teaching and learning facilities and tools needed for implementing updated curriculum and new pedagogical methods.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Provide institutional grants through performance based allocation system • Conduct a thorough stocktaking of the teaching and learning facilities and equipment for gap identification	• Performance-based institutional development funding scheme is fully institutionalized • Facilities and equipment are maintained sustainably • Facility guidelines are formulated	UGC, NU, DSHE, DTE, MoE, universities, colleges, polytechnics

58. Improve Skills for Job Search and Career Development among Post-Secondary Students:

Job search and career development skills would need to be enhanced to reduce frictions in job market. Skills matching does not occur automatically. High quality career guidance provided by education and training institutions would greatly help graduates and parents to make informed career or further education choices that are in line with present and foreseen job opportunities and skills/qualification requirements. However, career support and career education are in many cases unavailable at education institutions in Bangladesh. Career support unit can be established at tertiary education institutions to provide career guidance and available employment information at locality, and to maintain alumni network. The government can establish policy framework for public institutions to establish career services and provide them with training. Private institutions typically have stronger incentives to support students in job search. They would also benefit if the government can provide technical and financial assistances.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Conduct situation analysis • Design and pilot new extracurricular training for job search and career development	• Career development training institutionalized at post-secondary institutions	UGC, DSHE, DTE, universities, polytechnics

3.2.2 SKILLING UP WORKERS AND PROFESSIONALS

Upskilling for Businesses and Professional Development for Workers

59. Expand Training for Female Workers and Female Business Owners:

Female workers deserve more skills development opportunities for jobs and entrepreneurship skills to be solvent self-employed business owners. Female enrollment has increased over the past several years thanks to targeted support such as female stipend program and skills training in garment manufacturing. However, access to skills development opportunities through both tertiary education and skills training have yet to be equal across gender[59]. Skills programs targeting females should be vigorously expanded, and female participation in training courses in subjects that are not traditionally 'female oriented' should be pursued more actively. Scarcity of employment opportunities for female workers is another challenge. Female workers are disproportionately affected by unemployment[60], and are often with limited mobility that prevent them from finding jobs away from home. To enhance women's employment and earnings, female entrepreneurship training coupled with awareness and behavioral change trainings would help female workers to be empowered and establish self-employment businesses in their locality.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Expand skills training in female oriented trades • Expand skills training for females in traditionally non-female oriented trades • Safeguard female participation in every training programs • Design business skills training for women in partnership with female associations	• Female entrepreneurship training regularly conducted for female SME owners	MoE, MoEWOE, MoLE, MoI, MoWCA, DoL, TVET institutes

60. Expand Training in Managerial Skills for Mid-Career Professionals:

Opportunities for skills development of mid-level managers should be expanded vigorously to alleviate severe human resource bottleneck for managerial positions. Having good managers in place who can oversee complex business operations and communicate effectively with business partners around the globe is of considerable value to all types of businesses enterprises in today's business environment. In particular, established industries such as RMG and ICT are employing a large cohort of mid-level managers and future managers, and have a strong demand for managerial skills. Training of such high-level managerial skills requires both extensive exposure to professional expertise and practical experience. Despite its usefulness, management skills trainings are by nature high-cost and vulnerable to turn-overs of trained staff. To overcome the risk of sub-optimal provision of this type of training, public support would likely to be warranted through cost/risk sharing schemes. Public and private universities and management training institutes would be brought in to design and provide specialized training programs dedicated to management related subjects for tertiary-level students and mid-level managers (i.e. executive training). Close partnership with experienced professionals from relevant industries would be essential.

[59] According to BANBEIS 2015 data, Gender Parity Indexes were around 0.43 for university, 0.82 for tertiary-level colleges, and 0.28 for TVET. Female share in TVET has increased drastically over the past decade; however, it still remains significantly lower.

[60] As of 2015, unemployment rate for female is 6.8% while that for male is 3.0%; female unemployment rates are particularly high at younger cohorts (10% for 25-29 years and 12% for 18-24 years); furthermore, the majority of female workers (63%) work in agriculture, compared to only a third of male workers; only around 28% of employed female workers are working as 'employees' of employers, as opposed to 44% of male workers doing so; according to the Labour Force Survey 2015/16.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Design mid-level manager training in selected industries in partnership with industry associations • Pilot mid-level manager training in association with post-secondary institutions and industry experts	• Mid-level manager training regularized at post-secondary institutions and industry associations	MoE, MoEWOE, MoLE, MoI, universities, TVET institutes

61. Establish Lifelong Learning System for Mid-Career Workers:

Skills development must be continual and lifelong in the age of rapid technological changes. Opportunities for learning and training are important for all people at different stages of life. In the age of rapid technological change, measures that support lifelong learning and upskilling will be essential to help increase job mobility of workers and adaptability of their skill sets[61]. Bangladeshi workers have limited opportunity for skills training after leaving education system. Lifelong learning opportunities for Bangladeshi workers should be expanded. Establishing a functioning lifelong retraining system involves effective cooperation and interaction between employer organizations and education/training agencies. Combined role of higher education institutions and TVET institutes will make most effective contribution that meet diverse skills needs for new technologies. Opportunity for training on new technologies would help businesses and employers to make timely investment and recruitment decisions and ensure smooth introduction of improved production processes that will contribute to productivity[62]. Cooperation and close interaction between employers and institution through development of training contents and delivery of training are crucial[63]. Specialized training programs, organized by skills training and higher education institutions in partnership with industries, could offer short- to mid-term skills training that are readily accessible for workers from companies operating in that specialty.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Conduct market analysis on life-long learning training • Design and pilot fee-based life-long learning courses at selected institutions	• Life-long learning program on offer for public at some institutions	MoE, UGC, DTE, DSHE, universities, TVET institutes

[61] OCED (2004) argues that while social protection programs to protect workers unable to keep up with technology diffusion are integral part of policy to help maintain social cohesion, measures to incentivize for work, upskilling, and restructuring are equally important to preserve a trustful social fabric.

[62] In recognition of importance of lifelong learning for productivity, SABER Workforce Development (WfD) system oversight dimension involves a policy action of facilitating life-long learning with a policy goal of diversifying pathways to skills acquisition.

[63] TVET Reform Project also recommends expansion of lifelong learning programs in Bangladesh and call for close partnership between employers' organizations and training institutions (TVET Reform Project, 2012). World Development Report 2012 also points to the importance of lifelong learning in job creation and highlight Singapore's successful lifelong learning strategy in 80's and 90's to upgrade lifelong learning for its labor force especially for those less well-educated.

62. Expand and Incentivize Skills Training for the Migrant Workers:

Bangladesh's migrant workers need to be more skilled in order to upgrade value added of their work and increase remittances to the country. Oversees' workers need to upgrade the skills prior to leaving the country and after coming back to the country. Female migrant workers particularly deserve skills training including safe migration skills. Proper incentive mechanism and skills recognition system have to be in place to motivate migrant workers to receive trainings. Manpower exporting agencies need to be made aware of skills recognition system to use it in their worker screening and sorting processes. Recognition of Prior Learning plays an important role in skills recognition for returnees. Strategies and measures need to be in place to enhance the branding of Bangladeshi workers and skills qualifications of the country.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Provide RPL to returnees • Integrate skills recognition in database and screening process • Expand skills training to future migrant workers and returnees, especially female migrant workers • Develop dialogue with foreign countries for mutual skills recognition	• Skilled migrant workers receive skills recognition • Migrant workers receive skills training prior to departure and post repatriation • Bangladesh skills certification recognized in a few countries and by most of agencies	MoE, MoEWOE, BTEB, BMET, DoL, TVET institutes

3.3 PILLAR 3: GREATER INVOLVEMENT OF THE DEMAND-SIDE OF SKILLS - PRIVATE SECTOR PARTICIPATION IN SKILLS DEVELOPMENT

63. Finally, in Pillar 3, a special emphasis is given to the role of the demand-side of skills, especially private industry sector. Private sector has a special role to play as an ultimate beneficiary and guardian of upskilled workforce. Policy measures in Pillar 1 and Pillar 2 would be empowered greatly if private sector stakeholders are also on board. This sub-chapter discusses issues related to private sector's engagements in skills development and possible strategies to bridge gaps to facilitate them.

64. Build Brand of Skills of Bangladesh and Expand Facilities for Private Sector Participation in Skills Development:

First and foremost, much work still need to be done to stir the awareness of employers about the value of technical skills for their businesses to foster the interest in investing in skills building at workplace and in the industry. Furthermore, for many years, employers have had a limited trust in the quality of skills of graduates and relevance of education of the education and skills training providers in Bangladesh. Sustained interventions using both new and traditional media are needed to propel employers' and society's awareness about the value of technical skills and nurture a greater trust in the quality of skills development system. Private industry participation and partnership in skills training provision and quality enhancement is of utmost importance for improving and expanding skills development for Bangladeshi youth and workers. In the face of enormous current and future demands for skills It takes on various forms, and can be leveraged and facilitated with public support[64]. There have been many successful cases in Bangladesh[65] and around the world. The government of Bangladesh should fully embrace the public private partnership approach and promote it wherever possible in its skills development agenda.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Conduct awareness workshops to industry partners at national and local levels • Conduct a study on regulatory systems to incentivize private sector participation in skills development	• Private sector participation in skills highlighted in national agenda • Regulatory system to incentivize private participation in skills training established	NSDA, NSDC, MoE, MoEWOE, MoI, UGC, DSHE

[64] Several key initiatives have been taken in Bangladesh to promote private sector participation in skills development. At the sector level, Industry Skills Councils (ISCs) and industry associations are an excellent platform for industries to collectively provide technical support to improve quality and relevance of skills training. ISCs are also tasked to analyze industry-specific skills gap and prepare industry-based action plans. Public support to ISCs are to be expanded and sustained. At the institution-level, institutional management cell (IMC) at short-course providers and polytechnics have been instrumental in facilitating active participation of local industry stakeholders in management of institutions.

[65] In Bangladesh, formal and informal apprenticeship has been a common way for private sector to fill skills gap and impart practical skills in Bangladesh, in particular among small and medium size enterprises.

65. Incentivize Employer-led Skills Training at Workplace through PPP:

Private sector-led skills trainings, both pre- and post-employment, have been an underutilized form of skills training in Bangladesh[66], despite promising potential benefits to both workers and employers[67]. In the era of constant technological changes, finding people with right skill sets is a constant struggle for employers. Workplace-based skills training helps employers address skills constraints in their businesses and workers to update their skills at workplace while earning incomes. Provision of public support to industry-led formal trainings would be justifiable in Bangladesh on the basis of market failures. Enterprises would have intrinsic incentive to provide skills training to their own workers to overcome their skills constraints and improve productivity; however, if left to their own devices, private skills provision will likely fall far short of adequate supply because of (a) anticipated high turnover of trained staff (leading to lower private return) and (b) high upfront cost for establishing such training systems (leading to liquidity constraints and free rider problem). High turnover is especially true when intended skills are of more generic nature. Employers would try to recover costs by lowering staff pay or avoid providing it altogether if risks are high. Public support in the form of financial incentive and partnership with employers' associations would be essential to alleviate such market failures. Employer-led training would play an important role to fill serious skills shortfalls and inadequate capacity of formal training institutions. Some industry associations have extensive training facilities. There are potentials of education-industry collaboration towards improving quality and relevance of TVET and tertiary education. Industry Skills Councils have been formed in 12 industries subsectors for the purpose of promoting public private partnership for skills development and those are still remained at nascent stage. As employer are training providers themselves, potential for providing most relevant training is huge. There are a number of formidable barriers, such as weak institutional capacity and lack of trustful relations that have hampered this potentially transformative partnership for skills. The government needs to further build up a partnership with key industry associations and establish an incentive system for private sector to fill skills gap.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Expand existing training program with industry associations • Initiate new training programs and modalities in partnership with industry associations for pre-employment and in-service training • Conduct surveys on in-service skills training for workers • Pilot incentive program for in-service training for workers • Expand / initiate official apprenticeship programs in selected trades with skills certification process	• Training programs with industry associations regularly conducted with increased share of private contribution • Incentive program for in-service training program expanded • Official apprenticeship program expanded and skills certificates provided	NSDA, NSDC, MoE, MoEWOE, MoI, MoLE, UGC, DSHE, DoL

[66] For instance, data from the tracer study on polytechnic graduates show that only around eight percent of polytechnic graduates have experienced workplace-based training after joining the firm.

[67] A thorough literature review on returns to on the job trainings (OJTs) by Almaida & Cho (2012) indicates that the empirical evidences from both developed and developing countries consistently show positive correlation between OJT experience and higher earnings by employees, though estimated size of return vary. A strong linkage has also been identified between OJT and productivity of firms.

66. Deepen Partnership with Private Sector for Improving Quality and Relevance of Post-Secondary Education:

TVET and tertiary education system should involve private sector in every stage of design and implementation of education and training. So much has been said but still so much to be done in Bangladesh about joining hands with private sector to improve quality and relevance of education and skills development services. Priority areas of partnership with and contribution by private entities, as envisioned in the national education policies, include the following (see Table 2). In practice, though still at a nascent stage, partnership with industry sector have been gaining traction in TVET and university sectors alike, with the support from the Ministry and various projects. In TVET sector, for instance, 12 Industry Skills Councils (ISCs) have been established as a main vehicle to coordinate improvement activities between TVET and key industrial sectors of the country. Despite the initial teething problems and varied level of success, some ISCs have been successful and actively involved in training provision, curriculum revision, and standard/qualification development.

Table 2: Key Areas of Industry Partnership for Skills in Post-Secondary Education in Bangladesh

Category	Areas/activities of partnership and collaboration
Private provision	a. Establishment of TVET and higher education institutes to meet expert manpower needs of the industry sector; b. Delivery of workplace-based skills training programs for their employees; c. Advocacy for workforce development;
Information & planning	a. Identification and forecast of skills demands of the industry sector; b. Situation assessment on skills development practices in the industry sector; c. Development of industry specific skills development plan;
Quality and relevance of education and training	a. Development of skills standard and qualification, and new curriculum; b. Support to schools, colleges, and training institutes for quality improvement of skills programs through curricula revision, material development, teacher training, guest lecturer, study tour, etc.; c. Apprenticeship programs, student training and exchange programs; d. Sabbaticals and placement of teachers in relevant industry sectors; e. Research and development collaboration especially in STEM fields.
Others	a. Sponsorship for education scholarships, and research fellowship for postgraduates; b. Placement of graduates;

Source: Derived from National Education Policy 2010; National Skills Development Policy 2011; Strategic Plan for Higher Education in Bangladesh 2017-2030.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Strengthen Industry Skills Councils (ISCs) • Strengthen curriculum development capacity of post-secondary education • Initiate national and local industry partners for curriculum improvement	• ISCs fully engaged in curriculum and contents review and development • Capacity for curriculum development with industry feedbacks among university faculty, National University, and BTEB improved and practiced regularly	NSDC, ISCs, MoE, MoEWOE, UGC, DSHE, TVET institutes, universities, colleges

67. Establish In-service Training Programs for Industry Professionals at Post-Secondary Institutions:

Avenue for in-service professional training (e.g., management skills training or up-skilling training on new technologies) provided by tertiary education/training institutions targeting industry professionals through partnership arrangement should be intensively explored as they would have tremendous positive benefits for both parties. Public support can offer some incentives to facilitate the partnership. Industry professionals would benefit from having in-service training exposure and networking with other professionals in the industry. At the same time, engaging industry professionals in training would provide tertiary education institutions with excellent opportunities to cultivate network of industry partners for job placement arrangement and exchange programs and to be responsive to the changing skills needs of industries through adjusting their education and training contents. A case in point is one Technical Training Center in Chittagong initiated a mid-management training course for industry professionals. According to the principal and some participants, this training program has proven highly popular among industrialists, and enabled the institution to expand the network with industries and establish solid reputation in their locality as a reliable source of skilled technicians. This type of partnership for in-service training for industry professionals should be explored and expanded further.

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Design and pilot fee-based in-service training programs for industries at selected post-secondary institutions	• In-service training for industries offered in some post-secondary institutions in partnership with local industries	MoE, MoI, UGC, DSHE, DTE TVET institutes, universities

68. Establish Specialized Skills and Research Partnership in Industrial Zones/Clusters with Post-Secondary Institutions:

Partnership between post-secondary institutions and private sector should be explored to set up special training programs in industrial zones. Bangladesh has set up Export Processing Zones (EPZs) and Economic Zones (EZs) which now employ a large number of workers and contribute a substantial share of export. Business areas of EPZs/EZs, however, have been mostly confined to labor-intensive low skilled manufacturing. Diversification beyond garment products and improving competitiveness are the major challenges for the zone authority[68]. International evidences show that zone programs that shrives only on exploiting low-wage workers are likely to be in a race to the bottom, while those that recognize the value of skilled workers will likely be in a position to enjoy upgrading[69]. When industries are concentrated geographically in industrial zones such as EPZs/EZs or IT Parks, higher education institutions and TVET institutions in their vicinity can play a unique role as skills provision partner to help fill anticipated skills gap in the zone[70]. Partnerships can be established between an agency of the zone and university/TVET institution to set up a dedicated common facility within the zone which have training functions with trainers from the institution, or a dedicated special course can be initiated within the institution with material and financial support from the zone. Training needs would range widely from master's degree for high-skilled professionals, special courses on supervision and management skills, and short-courses for low-skilled floor workers[71]. Furthermore, on the R&D side, universities can also act as an innovation facilitator to support local adaptation of imported technologies and compensate the zone's shortfalls in technology. Surveys on firms in the zone would reveal business, technology and skills needs and how partners from universities and TVET can be integrated. Across the world, there have been several good practices of skills development in special economic zones.

[68] Skakir & Farole (2011) gives a thorough review of EPZ development in Bangladesh.

[69] Farole & Akinci (2011) argues that in order to derive long-term economic benefits from EPZs, implementation of a broad range of polices is required, including promotion of skills development.

[70] Establishment of special economic zones such as free trade zones is often associated with substantial increase in skills gap which urges governments to promote TVET policies See, for instance, ABD (2017) for a case in Sri Lanka, World Bank (2008) for a case in Vietnam where industrial parks and export zones around Ho Chi Minh City were expected to need 500,000 skilled workers and faced skills bottleneck. Bangladeshi researcher also identifies a lack of skilled workers at various levels and low labor productivity as major obstacles to foreign direct investment in Bangladesh. See Rayhan (2009).

[71] Firm owners in economic zones may have limited understanding and awareness about positive impacts of staff training on firms' productivity. Awareness raising will be one important area of intervention for skills development in economic zones. (Elci, 2010). Skills training in the zones is also found to have positive long-lasting impacts on the host economy though catalytic and demonstration effects (Madani, 1999).

Box 1: Skills training at Industrial Zones – Cases of Asian countries

Category	Areas/activities of partnership and collaboration
China (Shenzen)	Three months of on-the-job training for operators (one month for class and two months for production practice); more than 80 adult education institutes (1990) but weak links between needs of enterprises in the EPZ and skills provided.
Korea (Masan)	Three months of on-the-job training for operators; overseas training for skilled workers (mainly in Japan).
Malaysia	Three months of on-the-job training for operators; Quality Control Cycles with monetary and other incentives (gifts, medals and commendation letters, etc.) for identifying problems and suggesting ways of solving them); little training for computer programming, technical engineering, and design work.
Philippines	One day to a few weeks of on-the-job training for operators; some firms (Japanese) rotate operators to make them familiar with between 10 and 18 interrelated tasks (three-month rotation).
Sri Lanka	One to three months of on-the-job training for operators.
Taiwan, China (Kaohsiung)	Three months of on-the-job training for operators; cooperative training programs between school/college and the firm in the EPZ. School/college provides the general education and the firms provide special technology training; some overseas training.
Thailand (Lat Krabang)	Three months of on-the-job training for operators; off-the-job training; study and experiment in the classroom and laboratory for some workers; overseas training (at parent company) for core employees in management and technology.
Turkey (OSTIM)	Vocational training for low-skilled workers; partnership with regional universities under which management trainings are provided to companies in cluster; research collaboration with regional university.

Source: Expanded based on White (2011); Elci (2010);

Case Study: Role of Cankaya University in OSTIM industrial zone in Turkey

The regional universities in Ankara have been the driving force in the development of OSTIM. Particularly, the role of Cankaya University is noteworthy. Partnership started in 2007 with a focus on the construction and engineering machines sector. Cankaya University, together with OSTIM, implements two projects with the funding from the European Union.

Under the projects, they organized two sets of trainings for SMEs in the cluster in 2009/100 on various topics including strategic management, R&D management and human resources management. Cankaya University is planning to increase and diversify training courses to develop skills and capabilities in cluster member companies.

The university also initiated a number of programs for its faculties to create linkages with the cluster companies. The students and their academic advisors of the university are encouraged to collaborate with SMEs in conducting their graduation projects by carrying out research at member firms. By end-2010, some 70 projects were completed by students.

Source: Elci (2010).

Short-term priority actions	Mid- to Long-term results	Agencies Responsible
• Conduct feasibility study • Design and pilot new training programs at industry zone in partnership with industry zone authorities	• Skills training programs by post-secondary institutions at industry zones operationalized in a few locations	MoE, MoI, BEZA, UGC, DSHE, DTE TVET institutes, universities

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ANNEX

ANNEX 1: KEY SKILLS CHALLENGES OF ON-GOING WORLD BANK FUNDED POST-SECONDARY EDUCATION PROJECTS

On-going World Bank funded development projects in TVET and tertiary education in Bangladesh have identified and addressed a range of major bottlenecks in the sector. Bangladesh's TVET and tertiary education sectors have been grappling with major institutional and sector-level challenges (see Below Box 2). The government has been undertaking a series of ambitious reform actions to tackle them, producing noteworthy results and lessons. These are all systemic long-term issues that will continue to be addressed by relevant authorities.

Box 2: Key challenges addressed in TVET and higher education projects in Bangladesh

TVET	• Low quality of attained skills
	  • Dilapidated infrastructure, unequipped labs and classrooms
	  • Weak enforcement of competency standards and quality assurance
	  • Quality of education from private sector remains contentious issue
	• Low relevance of training
	  • Weak linkages with labor market demand and industries
	  • Lack of qualified teachers
	• Inadequate access & equity
	  • Significant gender disparity (female in skills training: 24 percent)
	  • Low proportion of students/trainees in skills training
	• Weak sector management
	  • Weak coordination in the skills development sector
	• Weak social perception for TVET

Higher education	• Inadequate access & equity
	  • Low enrollment: Gross enrollment, at 13%, lags behind India/Sri Lanka and averages for upper middle-income countries (44%) and lower middle-income countries (23%)
	  • Inequitable access: Hugely biased towards urban centers, males and the economically well-off
	• Low participation in Science, Technology, Engineering and Math (STEM) fields
	  • Only 32% of university students are in STEM disciplines, especially low among females at 25%
	• Low quality & relevance of education
	  • Underdeveloped quality assurance mechanism
	  • Weak linkages with labor market demand and industries
	  • Quality of education from private sector remains contentious issue
	• Weak research outputs
	  • Underdeveloped research capacity and financing, poor intellectual property management, and weak research collaboration with industries

Sector-level issues	• Low tertiary education public expenditure as a share of GDP • Inadequate policy framework, resources, and implementation capacity for quality assurance and industry linkage • Weak capacity for sector-wide coordination • Weak governance and lack of institutional autonomy • High politicization

Source: By Authors based on policy briefs and sector analysis, and Project Appraisal Documents.

ANNEX 2: HIGHER-ORDER THINKING SKILLS AND SOFT SKILLS TRAINING IN POST-SECONDARY EDUCATION

Higher-order cognitive skills: Are abilities of individuals involving complex thinking and judgement process applicable to a wide range of tasks and problems; for instance, analytical skill, critical thinking, problem solving, effective communication, and leadership skills.

Soft skills: Are characteristics of individuals across multiple domains of social, emotional, personality, behavioral, and attitude; for instance, responsibility, effort, discipline, grit, and determination, self-confidence, sociability, and emotional stability.

WHY DO WE NEED HIGHER-ORDER COGNITIVE SKILLS AND SOFT SKILLS?

1. Employers across the globe are increasingly seeking workers with higher-order cognitive skills and soft skills, and there's a growing body of evidence that associate such skills to better job outcomes and higher wages[72]. Today's work environment is complex and fluid. In contemporary global economy, business processes and technologies are constantly changing and creating unique skills requirements for workers. Higher-order cognitive skills, such as complex problem-solving skills, strong communication skills and collaborative team work skills, and sophisticated ICT skills, are therefore in high demand. By 2020, it is expected that on average, more the one-third of the core work-related skills considered critical for jobs by employers will comprise mostly of higher order cognitive and soft skills (WEF, 2016). Higher cognitive skills and soft skills have also been associated with wage premiums among workers in low and middle-income countries (Nomura and Adhikari, 2017; Valerio et al., 2016). In developing countries, expected returns of higher-order cognitive skills to individual and national incomes are found to be higher compared to those in developed countries, placing urgency for governments to invest in work-related high-level cognitive skills (Valerio et al., 2016).

2. The trend is the same in Bangladesh; However, employers are not finding enough workers with good higher-order cognitive skills and soft skills. Basic literacy and numeracy skills needed to support complex problem solving and decision-making remain low among formal sector workers (World Bank 2013)[73]. A low availability of workers with sufficient cognitive and soft skills results in these skills to be in high demand and compensated by higher pay among employers in Bangladesh (Nomura et. al, 2017; World Bank, 2013). An enterprise-based skills survey shows that employers also rank soft skills over cognitive skills for effectiveness in jobs in Bangladesh (World Bank, 2013). However, both professional and non-professional employers struggle to find employees with sufficient soft skills. Despite 'responsibility' being rated as the most sought after characteristic by employers, only around 42 percent and 17 percent of professional and non-professional employers respectively reported that employees are sufficiently responsible (ibid, 2013).

HOW DO WE GO ABOUT DEVELOPING HIGHER-ORDER COGNITIVE SKILLS IN BANGLADESH?

3. Post-secondary education institutions can and should play a critical role to develop these skills among individuals. Good practices to support higher order cognitive and soft skills development at education institutions can be learned from other countries. Strategies that have been practiced and known to work include the following:

Active Learning: There is a good body of literature that shows active learning methods in teaching tend to improve higher order thinking skills and soft skills among students in post-secondary education[74]. Inadequate availability of modern teaching equipment and teachers' training can be a hindrance to use of this method in the classroom, and need to be carefully addressed (Chowdhury, 2016; Mazumder, 2014).

[72] A number of studies have examined the links between cognitive and soft skills development with individual wage premiums and economic growth: Kautz et al. (2015); Nomura and Adhikari (2017); Valerio et. al (2016); World Bank (2010).

[73] World Bank (2013) reports that the average literacy and numeracy score (out of total score 8) increases from 0.5 among non-educated to 2.1 among primary education completers, 3.5 among junior school completers, and 5.5 among secondary school completers.

[74] Some literature on the benefits of active learning include: Freeman et. al (2014).; Hopson, MH., Simms, RL., and Knezek, GA. (2014); Fisher, K. (2010); Sivan, A., et. al (2010).

Specialized Program: Universities and colleges are also introducing special training programs with higher-order cognitive skills and soft skills learning components to support professional development and better employment. Cognitive Skills Program at PennState University, for instance, provide comprehensive skills development and learning program through workshops, interactive learning sessions, and resources to support individual thinking skills and graduate employment. Stanford University's Stanford MSx program provides business students with customized leadership practice opportunities along with the core technical learning modules during a year-long program.

Integration with Framework and Curriculum: Another good strategy is to include higher-order cognitive skills and soft skills development in the education and skills qualification framework as well as in curriculum (OECD, 2015). Australia, for instance, included higher order cognitive and soft skills as part of its National Safe Schools Framework and adopted these skills as part of national curriculum[75]. The Illinois State Education Board in the United States also developed standards for social or emotional skills development among K-Grade 12 students and regularly monitors the achievements of these skills among learners.

Assessment and Tracking: Assessing and tracking the levels of higher-order cognitive skills and soft skills gains among students is also a good means to inform policy and improve outcomes. Rigorous analytical assessments have been conducted in countries like the USA, India and China to assess, analyze, and compare students' higher-order cognitive skills as well as technical skills at the university level (Loyalka, 2017). This would allow policymakers and practitioners to benchmark graduates' skills relative to other countries and understand factors and strategies in the country's education system to improve the development of these essential skills.

4. Bangladesh has several nascent but promising good practices especially among private entities. Several private universities and non-governmental entities in Bangladesh have developed learning modules or established training centers within the institutions focused on enhancing cognitive and soft skills among students (Table 1). These efforts are aimed to support graduate employability, which remains critical to attract student enrollment in the private universities. A good number of private initiatives have developed courses to provide non-technical skills training to students and job seekers. Nonetheless, the provision of these training is mostly concentrated in the metropolitan cities and remain inadequate in comparison to the needs of employers.

Table 1: Good Practices of Higher-order Cognitive Skills and Soft Skills Training in Bangladesh

Programs & Institution	Description
Residential Semester Program **Professional Skills Development Program** ***BRAC University***	**Residential Semester** aims to develop a range of soft skills and personality qualities among undergraduate students. The residential semester focuses on four areas of development: (i) improving **communication skills**; (ii) creating strong sense of **responsibility**; (iii) developing firm principles to guide students in **decision making and action**; and (iv) providing **holistic education** through academic and extracurricular activities. **Professional Skills Development Program** (PSDP) which is a 13-week modular course designed to improve BRAC University student's employability, in response to employers' increasingly diverse and sophisticated needs. It focuses on enhancing the **all-round development** of students, by building a variety of skills sets that increase their appeal to employers and improve their **'on the job' performance**.
Center for Cognitive Skills Enhancement ***Independent University Bangladesh***	**Center for Cognitive Skills Enhancement** aims to build higher-order cognitive skills through engaging undergraduate students in **logic, rationalization, problem solving and decision making** experiences using digital tools like **games, apps** as well as active learning experience such as **research activities**.

[75] The Australian Curriculum Assessment and Reporting Authority identified seven general capabilities to be addressed in the Australian curriculum. The general capabilities are literacy, numeracy, information and communication (ICT) competence, critical and creative thinking, ethical behavior, personal and social competence, and intercultural understanding.

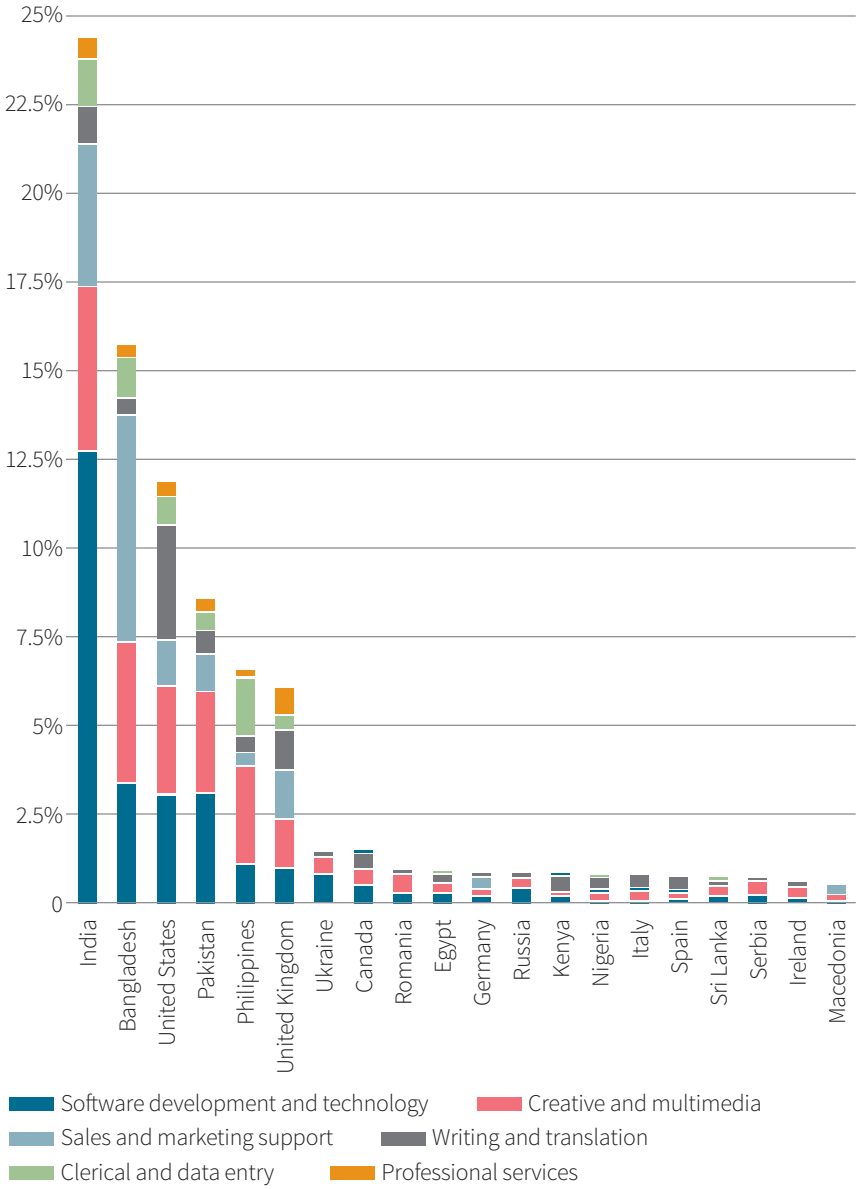
Programs & Institution	Description
Leadership Program ***Bangladesh Youth Leadership Center***	Bangladesh Youth Leadership Center's training programs provide face-to-face and online training courses focusing on development of higher-order cognitive skills, including **leadership, problem solving and critical thinking, communications skills and pre-employment/professional development training** for undergraduates, graduates and professionals.
Bdjobs.com	The online job search platform provides a range of training workshops and certificate programs to support technical and soft skills development of job seekers and professionals.

5. Several universities in Bangladesh are piloting active learning approach to nurture higher order cognitive and soft skills. Several universities in Bangladesh are gradually moving toward student-centered teaching and learning practices. Higher Education Quality Enhancement Project (HEQEP) supported universities to implement more than 100 projects focusing on upgradation of teaching learning facilities, curriculum improvement, and pedagogical capacity development including student centered approaches. Student satisfaction surveys showed that university students are participating more in classroom learning involving technological media, work-based seminars and workshops, and are more satisfied with the teaching-learning environment.

ANNEX 3: ICT, TECHNOLOGY, AND SKILLS

DIGITAL TECHNOLOGIES AND NEW JOBS

1. Digital technology is creating new occupations and opportunities for digital jobs. Information, communication technology (ICT) and IT-enabled services (ITES) opportunities have grown substantially with new types of jobs that did not exist a decade ago. For instance, in 2014 alone, Upwork, the largest online outsourcing service, posted 2.8 million digital jobs worldwide (WDR, 2016). Currently, IT and business process outsourcing (BPO) services are one of the fastest growing sectors globally in the world. The ICT and ITES sector in Bangladesh is growing consistently at an estimated rate of 20 to 30 percent per year (GED, 2012). Computer programmer, mobile app designer, graphic designer, ICT specialist are the emerging new types of jobs that dominate digital industry. A wide range of new jobs are expected to be created in fields such as data analysis, computer science and engineering. Research on returns to ICT skills on labor market shows one-standard-deviation increase in ICT skills raise earnings by about 25 percent (Falck, Heimisch, & Wiederhold, 2016). ICT is making jobs more efficient, productive, innovative, and flexible.



Source: Online Labour Index, July 2017

Figure 1: Top 20 Online Labour Home Countries

2. Digital technology has transformed the nature of work, and online job opportunities are available for workers with varied skill intensity. Micro work, and online contracting are the new types of work for which any person from anywhere in the world with access to internet and the right sets of skills can compete and participate. Micro work means a larger task is disaggregated into smaller tasks that are commissioned out to many workers. Currently, globally more than 10 million people are working online, many of whom are from developing countries (Raja & Ampah, 2016). An online worker in Bangladesh can work as a virtual assistant for an employer based in any country in the world, and potentially can earn much higher wage than any local employee. As of July 2017, Bangladesh was the 2nd largest supplier of online labor only after India, according to the Online Labour Index (see Figure 1). Online job opportunities are available for a wide range of tasks. These tasks range from carpentry to graphic design to software programming and in both formal and informal sector. Digital designing, accounting or auditing, web development and search engine optimization are examples of services

requiring high to medium level of skills. Opportunities are also available for services requiring semi or low level skills such as data entry, digitizing receipts, gathering information and images, classifying products or tagging images, etc. With some basic training workers can easily start a digital career. For instance, computer-illiterate Somali refugees in Kenya started to work and earn money as micro workers after receiving basic training provided by an online work platform named SamaSource.

DIGITAL TECHNOLOGIES AND IMPLICATIONS FOR SKILLS

3. This new form of IT-enabled jobs requires certain skills to compete globally and perform job function locally. As English is the lingua franca of the global business world, knowing the language, being able to understand, and effectively communicate in English is a prerequisite to participate in the globalized marketplace. Globally relevant technical skills, including computer and communication skills are valuable to find tasks that one would be able to perform. Soft skills are needed to navigate communication and universal cultural norms of global marketplace. Online learning platforms (e.g. Coursera, edX, Udacity, Samaschool, Udemy Online Course, School of Skills,) and massive open online courses (MOOCs) are available to develop both technical and practical soft skills that can equip one with basic skills needed to participate in global marketplace as well as for local IT-enabled jobs. To achieve long-term benefits, lifelong learning to keep pace with rapid change in IT is a must.

4. Complex problem-solving, critical thinking, and cognitive abilities are crucial skills for ICT-enabled jobs. Based on a survey on future jobs, World Economic Forum identified the major drivers of change for future jobs. The top trends impacting ICT business models are - mobile internet, cloud technology (69%), processing power, big data (44%), changing nature of work, flexible work (36%), internet of things (33%), consumer ethics, privacy issues (31%), new energy supplies and technologies (17%), longevity, ageing societies (14%), sharing economy, and finally, crowdsourcing (11%). Based on World Economic Forum Report 2016 on future of jobs, computer and mathematical, sales and related, and architecture and engineering are the main job families under ICT that are expected to grow in the period 2015-2020. Below is the list of key skills in demand for 2020 for some of ICT enabled jobs.

SOME OF GOOD PRACTICES AND ON-GOING EFFORTS IN ICT AND SKILLS AROUND THE WORLD

5. Coding Bootcamps – Emerging technical skills training programs: Technology-led transformation of jobs which call for new type of skills has given rise to newly emerging tech-skills training programs in the private sector known as 'Coding Bootcamps'. These are short-term, intensive, typically three to six months long, rapid training programs that are closely linked to vocational training but adapted for specific and demanded digital skills. Typically, the programs have competitive selection process, and follow a project-based, experimental learning approach. Bootcamps originated in advanced economies, but now present in many emerging countries such as Columbia, India, Kenya, Lebanon, Peru etc. Governments can tap into these training resources for upskilling its workforce following the footsteps of the Municipality of Medellin in Columbia and other countries.

Table 1: Key Skills Demanded in ICT-enabled Job Family for 2020

Programs & Institution	Key Skills for Job	Skills bundle
Software Developers	Complex problem Solving	Complex Problem Solving
Information Security Analysts	Critical Thinking	Process Skills
Data Analysts	Cognitive Flexibility	Cognitive Abilities
	Mathematical Reasoning	Cognitive Abilities
	Active Learning	Content Skills

Source: The Future of Jobs Survey, World Economic Forum, 2016.

Case:

Coding Bootcamps in Medellin, Columbia - Private-Public Partnership in ICT Skills Development. To promote innovation and equip its citizens with the new 'future-safe' skills, the Municipality of Medellin in Columbia supported the expansion of Coding Bootcamps in the city. A public joint venture, Ruta N, between the Municipality and the Empresas Publicas de Medellin (EPM) has been developed in partnership with the World Bank to lead and introduce Bootcamps in the city. One particular goal of the program is to upskill marginalized youth by targeting and including young people with limited skills and from low income background. To evaluate the gaps in the market and skills needs Ruta N assessed the market potential for junior and senior developers in the city. The first Bootcamp in the city was subsidized by Ruta N to test its feasibility and reaction and reception by local industry. The program was expanded after receiving positive response. To incentivize participation of disadvantaged youth the program provides subsidies to participants based on their income level.

6. Karnataka ICT Skills Development Society (ICTSDS): Karnataka government formed ICTSDS in 2014. Collaborating with private sector and international organizations, ICTSD has developed and offers ICT skills development projects to support various target groups. Electronics System Design and Manufacturing (ESDM), New Age Incubation Network (NAIN), Karnataka's Initiative on Technology-based Solutions for Elderly (KITE), Technology Business Incubators (TBIs), and Chetana Empowering Girls with Technology Department of IT, BT and S&T, Government of Karnataka - are the projects that have been developed since the society's inception and currently ongoing.

Case:

Chetana: The innovative program "Chetana" targets girls with top performance in Secondary School Examination from government schools across the state to educate, empower, mentor, and support them. Selected girls are first invited to a 5-day residential camp. Various activities during camp include training session to use laptop that they receive as a gift on their arrival, exposure to state-of-the-art facility, group building exercises, sports events, Design thinking workshops, interaction session with leaders etc. These Chetana will be hand-held for two years post-the camp. Specific residential programs have been designed to impart "One Skill in each interaction" for consecutive two years. The government partnered with private sector and tertiary educational organizations for best results. In 2016, the first year of its inception, 356 girls with top performance participated in the residential camp conducted at Infosys campus in Mysore. Samsung conducted the hands-on session to use the laptops that they provided. As part of the program the scholars were divided into groups and sent to five top institutions for 10-days of orientation. The program aims to nurture and mentor local female talent to empower them with high-end technology and skills to provide wings to their dreams.

7. Malaysia Digital Economy Corporation Sdn. Bhd. (MDEC): Malaysia, with its plan to transform to digital economy, launched a holistic government-owned agency "Malaysia Digital Economy Corporation Sdn. Bhd. (MDEC)" in 1996. Along with nurturing the growth of local tech companies whilst attracting both foreign and local direct investments, the agency upholds a strong focus on mobilizing a future generation equipped with relevant skills to thrive in a digital economy and improve their employability globally. To ensure that the demands of current and future industry-relevant talents are met, the government has launched talent initiatives and programs tailored for different groups:

Undergraduates: Specific programs have been created that will assist in increasing the uptake of computer science and technological courses at tertiary level.

Fresh graduates and working professionals: To expand IT-savvy workforce, sustainable industry-led talent development models has been adopted.

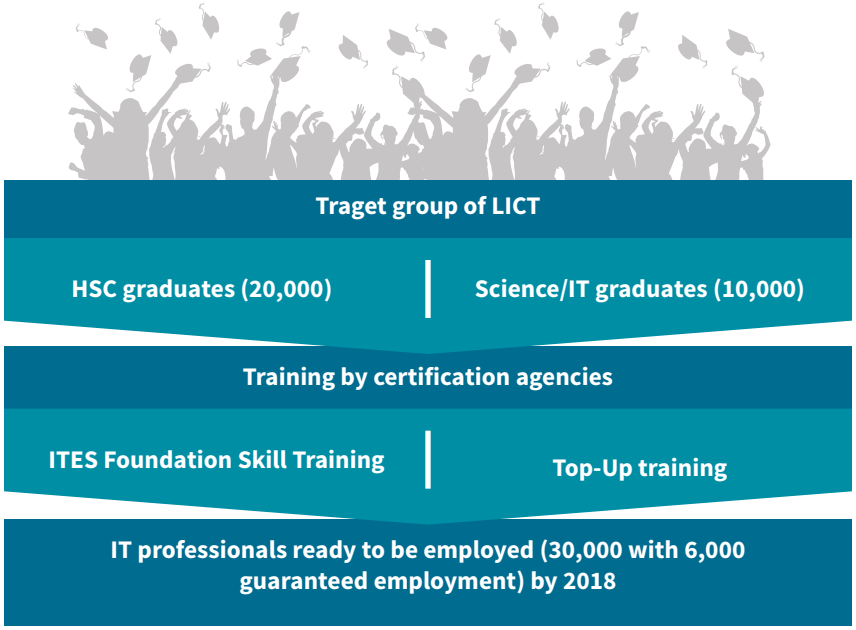
Digital makers: To cultivate interest and skills in digital innovation and creativity amongst school students and youths to increase the interest and uptake in Science stream in upper secondary and STEM undergraduate courses, to strengthen talent readiness for connected economy job opportunities.

ERezeki: With the aim to develop a crowdsourcing ecosystem in Malaysia, eRezeki allows individuals to register as digital workers and perform simple digital-based tasks to generate income. To develop digital workers, eRezeki profiles, trains, assesses, and qualifies individuals for digital jobs. Once qualified, the program matches suitable tasks to registered individuals.

EUsahawan: The program connects Malaysian youth and micro-entrepreneurs to public Technical and Vocational Education and Training (TVET) institutions to develop their digital entrepreneurship know-how and enable their transition from job seekers to job creators.

ON-GOING EFFORTS IN ICT AND SKILLS IN BANGLADESH

8. Bangladesh ICT/ITES Skills Initiative: With an objective to catalyze the growth of IT and ITES industry for employment creation and export diversification, "Leveraging ICT (LICT) for growth, employment and governance" project was launched by the government in 2015 with support from the World Bank. To develop skilled workforce for IT and ITES sector, the project offers two fully-funded comprehensive targeted training programs to selected graduates: (i) Top-up training for IT and Science graduates, and (ii) ITES Foundation Skills Training for HSC graduates and equivalent. GoB has appointed international certification agencies to ensure quality global standard training. By 2018, the program aims to train 30,000 IT professionals – 10,000 receiving Top-up IT training and the rest 20,000 receiving ITES Foundation Skills training. The program will provide jobs to 6,000 Top-up IT training receivers upon completion of the training. In addition to skills training, the project links certified IT/ITES graduates to potential employers through an online platform (www.bdskills.com).



9. University Incubation Center for ICT enabled Works: With an aim to bridge the gap between ICT industries and academia for fostering meaningful research, innovation, entrepreneurship, job creation, and human resource development, GoB has established the first university-based incubator at the campus of Chittagong University of Engineering and Technology (CUET). Learning and Earning, Training for Mobile Apps, Employment and Governance Project are examples of other GoB initiated ICT-related skills training projects. Special emphasis has been put forward to ICT education up to high school.

10. Access to Information project (a2i): In recent years, with increased digitization in the country, the public service delivery system of Bangladesh has undergone substantial digitization under "Access to Information, a2i" project of the Government of Bangladesh (GoB), showcasing the need of digital skills upgrading even in the public sector. One of the key challenges identified by the a2i is the capacity gap of public officials in conceiving the usage of ICTs for improving public service delivery (Chowdhury & Zaman, 2014).

ANNEX 4: SKILLS INITIATIVES IN THE BANK SUPPORTED NON-EDUCATION PROJECTS IN BANGLADESH

1. The World Bank is currently supporting several projects with a skills training or employment component in Bangladesh across five Global Practices[76]. Through the different World Bank supported projects, the government is tapping into new areas of skills development, including early childhood development (Income Support for the Poorest Project), pre-employment training (Northern Areas Reduction-of-Poverty Initiative Project) and post-employment training for professionals (Private Sector Development Support Project, Health Sector Development Program). Skills development components under these multifaceted projects entail varied forms of training and service delivery and target a diverse range of beneficiaries. The projects such as Private Sector Development Support Project, Leveraging ICT for Growth, Employment and Governance and the Health Sector Development Program include technical training components for increasing skills in the relevant sectors. The Northern Areas Reduction-of-Poverty Initiative Project involves a combination of technical learning and life skills training for extreme poor women, while the Income Support for the Poorest Project focuses early childhood development through providing cash transfers to poor pregnant mother to avail health care services. These are all specialized short-course training programs and delivered through partner training providers from government agencies, NGOs, training institutions, and private enterprises.

Table 1: Key Skills Demanded in ICT-enabled Job Family for 2020

Projects	Period	Amount (USD million)	Contributions to Skills Development and Labor Market	Results till Date
Private Sector Development Support Project (P120843) **Trade & Competitiveness Global Practice**	2011 - 2021	172	The Project Development Objective (PDO) is to facilitate investment in growth centers in the emerging manufacturing and services sectors of the economy with the aim of generating employment. In one of the components, it supports training institutions to develop a curriculum based on market demand and to collaborate with firms. (source: PAD)	Created 12,310 new jobs, of which 27 percent are for women, against a target of 4,500 jobs by June 2017 (30 percent for women).
Export Competitiveness for Jobs **Trade & Competitiveness Global Practice**	2017-2023	100	The PDO is to contribute to export diversification and more and better jobs in targeted sectors. (source: PAD)	The project is expected to impact the targeted sectors through (i) Increase in number of firms directly exporting; (ii) Create opportunity for new and better jobs and (iii) Increase in average wage growth for beneficiary firms.
Leveraging ICT for Growth, Employment and Governance **Transport & ICT Global Practice**	2012-2019	63.5	The PDO are to: (i) Catalyze the growth of Bangladesh's IT/ITES industry for employment creation and export diversification; and (ii) Establish basic e-Government foundations to support public sector modernization. (Source: PAD)	Generating 30,000 direct IT/ITES jobs; created 12,000 jobs to date.

[76] The GPs include: Agriculture; Social, Urban, Rural & Resilience; Social Protection & Labor; Trade & Competitiveness; and Transport & ICT.

Projects	Period	Amount (USD million)	Contributions to Skills Development and Labor Market	Results till Date
Income Support for the Poorest Program **Social Protection & Labor Global Practice**	2014-2020	303	The PDO is to provide income support to the poorest mothers in selected Upazilas, while (i) increasing the mothers' use of child nutrition and cognitive development services, and (ii) enhancing local level government capacity to deliver safety nets.	Approximately 4,000 beneficiaries have been enrolled across select locations. Beneficiary services and cash transfers are expected to commence from October 2017
Northern Areas Reduction of Poverty Initiatives **Social, Urban, Rural & Resilience Global Practice**	2011-2018	29.3	The PDO of the project is to facilitate access to employment opportunities in the garment sector for poor and vulnerable women from lagging areas of Bangladesh by providing information, technical and life skills training, transitional housing, and other support to adjust to urban life and formal sector employment.	1,563 girls graduated by Aug 2017 and more training is underway. There are currently approximately 8,000 jobs lined up and more will be created.

ANNEX 5: KEY ACHIEVEMENTS OF THE BANK SUPPORTED SKILLS AND TERTIARY EDUCATION PROJECTS

1. Overview: The Ministry of Education and World Bank have been working together in post-secondary education and training sector to support the development of skilled workforce and reduce skills gaps and mismatches. These development efforts in skills and tertiary education are the followings. **Skills and Training Enhancement Project (STEP)**, a flagship skills project of Ministry of Education, has initiated system-level reforms in TVET and institutional capacity strengthening activities to improve the quality and relevance of TVET and enhance equitable access to skills training for women and the poor. In higher education, **Higher Education Quality Enhancement Project (HEQEP)** is the first major donor supported intervention implemented by University Grants Commission, working toward ensuring quality and demand-driven university education to produce highly-skilled manpower and inculcating culture of research and innovation in the universities. Another intervention in higher education, **College Education Development Project (CEDP)**, focuses on capacity building of the tertiary-level colleges system, institutions, and teachers to improve quality and relevance of college education.

2. Key Achievements of STEP: STEP was incepted in 2010 with the aim to improve access and equity in TVET for socio-economic disadvantaged households through stipends, enhance teaching learning environments in polytechnics through institutional grants and improve market relevance of TVET curricula through partnerships with industry and global TVET leaders. STEP also promotes sustainable implementation capacities and good governance at all levels of skills development system through capacity development programs. Through mass communication and mobilization, the project is facilitating changes in mindset and social perception among the society about TVET. (see Table 1 for more details)

Table 1: Key Achievements in TVET supported by STEP

Access & Equity	193,976 poor diploma students from 162 polytechnics supported through stipends. Female beneficiary share increased from 10% to 21%. Short course training provided to more than 100,000 individuals (31% females)
Teaching and Learning	33 polytechnics upgraded classrooms and labs with modern equipment and teaching facilities
	400+ teachers and managers completed specialized training from Singapore while around 4,500 participated in local training
	Filled up 95% of vacant teaching posts in government polytechnics
Linkages with Industry	Supported market relevant curriculum through establishment of Institutional Management Committees in 33 polytechnics
	Established 500+ industry partnerships
Introduction of Innovative Practices	Operationalized Recognition of Prior Learning which assessed over 17,000 informal workers. Introduced SSC (Voc) apprenticeships linking the curricula with industry

3. Key Achievements of HEQEP: HEQEP focuses on improving the quality and relevance of the teaching and research environment in the universities. The project supports improvements in teaching learning and research facilities at the universities through availability of competitive innovation funds, the establishment of high speed connectivity and introduction of quality assurance activities at national and institutional levels. Since inception in 2009, the Project is credited to many achievements in research and innovation the university sector in Bangladesh. (see Table 2 for details)

Table 2: Key Achievements in University Sector supported by HEQEP

Teaching Learning	Supported upgradation of classrooms and labs in 36 universities
Research and Innovation	More than 400 academic innovation grants implemented; 10 university-industry collaboration projects, three Technology Transfer Offices and 8 FabLab projects to spur innovation . Six innovations submitted for patenting while another five in the pipeline.
Connectivity	Bangladesh Education and Research Network (BdREN) connected in 36 universities
	Digital Library providing over 34 thousand e-resources to 80+ members, including public and private universities and research institutions.
	More than 50% of students and faculty with access to internet
International Partnerships	Partnerships forged with universities from the USA and UK
Quality Assurance	QA introduced in higher education with 800+ self-assessments conducted at the universities
	The Accreditation Council law enacted for establishing the Council

4. Key Achievements of CEDP:
Incepted in 2016, the CEDP focuses to build the National University college system's capacity to plan, manage, implement, and monitor their institutional programs and strengthen the foundation for the next phase of development activities. The project supports the development of a Strategic Plan for the College Subsector, to provide directions and goals for the college education subsector and a consensus-based plan of action. Through the availability of competitive grants, CEDP promotes institution-led activities that focus on creating quality teaching learning environment in government and non-government colleges. CEDP encourages professional development of teachers through training offered by an international training consortium, comprising of national training-offering agencies and the University of Nottingham as an international partner to ensure global best practices in teacher training. Additionally, the project supports teacher deployment in government colleges and reform for recruitment process of teachers for non-government colleges. (see Table 3 for details)

Table 3: Key Achievements in the College Sector supported by CEDP

Teaching and Learning	More than 100 competitive institutional development grants to be awarded to government and non-government colleges for improving teaching learning environment.
	Around 2,500 lecturer posts filled in for improving teaching strength in the government colleges
Strengthening Sector Management and Planning	The National Strategic Planning Committee and expert groups for development of the Strategic Plan formed
International Partnerships	Partnership forged with the University of Nottingham Malaysia Campus for professional development of 8000 college teachers and managers; already 99 Master Trainers initiated their program of study leading to the Masters of Arts in Education upon successful completion.

ANNEX 6: SKILLS CHALLENGES IN BASIC EDUCATION IN BANGLADESH

1. Basic education generally covering pre-primary, primary and secondary levels of education, are the stages when critical foundational skills, such as literacy and numeracy, develop in an individual. Primary education in Bangladesh spans grades 1–5 while secondary education in Bangladesh spans grades 6–10. Pre-primary schooling comprises of one year of education prior to initiation of primary education. This stage also lays the foundation for development of non-cognitive and soft skills.

2. Low levels of learning during primary and secondary education create weak foundational skills in literacy and numeracy. Among Grade 3 students, 59% did not achieve the grade-relevant competencies in Mathematics while the corresponding figures for Grade 5 were 90%. This crisis in learning continues onto secondary schooling. Only 43 percent of Grade 8 students had acquired the competency required of the grade in Mathematics in 2015. Children from the poorest income quintiles are performing worse than those from the wealthiest quintiles. These students are most at risk of dropping out, and likely to join the informal labor market. Some of the underlying factors: low student readiness at primary school entry due to inadequate early childhood education, weak reading and numeracy skills, inferior quality of teaching and use of student assessment system. Significant efforts have been made to improve students' foundational skills. One year of pre-primary schooling was introduced to head start children in gaining better foundation skills. In secondary education, the ministry introduced the Developing Reading Habit activity to cultivate basic reading skills.

3. A supply of teachers with good teaching skills is one of the most critical school level challenge in ensuring quality learning in Bangladesh. Teachers mainly follow the conventional teaching approach, reading textbooks and lecturing, while assessments are conducted in manner that rewards rote learning. Lack of effective pedagogical training affects the quality of teaching and learning, and hampers cognitive and soft skills development such as critical thinking, problem solving, communications skills. Teachers' professional development have been at the core of improving basic education. In primary education, the PEDP 3 introduced a diploma in education program for teachers and expanded it nationwide. In secondary level, provision of training for teachers were conducted under the Secondary Education Access and Quality Enhancement Project (SEQAEP) and Teaching Quality Improvement in Secondary Education (TQI), focusing on improving teaching facilities as well as pre-service and in-service teacher training.

4. Development efforts have been taken to transition toward competency-based skills development at primary and secondary education levels. The third phase of the Primary Education Development Program (PEDP) ran the transition to competency-based learning with the aim to develop better problem solving and critical thinking skills among primary school goers in 2011. National student assessments were also introduced at Grade 3 and 5 in primary and Grade 8 and 10 in secondary, with three rounds completed, providing valuable measures on competencies gained in important subjects such as Bangla and Mathematics. At the secondary level, national examination reforms and classroom based assessments have also been initiated.

5. Moreover, several systemic challenges impede effective learning and skills development in basic education. First, the extensive examination system largely limits incentives for innovative and high-quality teaching and learning. Second, robust performance standards for schools and teachers are missing while articulation of competencies for students remains underdeveloped. These standards are important to guide sector activities and measure performance. Third, there is large scope to improve coordination between different education subsectors in delivering coherent skills development from basic to secondary and to higher education.

ANNEX 7: SUMMARY OF STAKEHOLDER WORKSHOP

The World Bank education team organized two consultations on '***Bangladesh Skills for Tomorrow's Jobs***' to support the ASA on Skills Strategy: Skills for Better Jobs (P164139) on July 12th and 13th, 2017 in Dhaka. The consultations were held at the World Bank office involving academics, representatives from industry skills councils, NGOs, and other stakeholders on July 12, 2017.

The main objective of the consultation was to gain insight on the opportunities and obstacles in quality workforce development through higher education and skills training in Bangladesh and jobs. The World Bank education team shared the attached presentation at each consultation to facilitate the discussion.

The key findings from the two consultations are summarized below:

Inadequate information on the skills demand in Bangladesh: There is a need to understand the current and future demand for different skills across major industries through surveys and analytical work. Limited information exists within the sector (i.e. RMG, ICT, etc.) thorough their respective industrial council; however, a macro perspective is needed to inform the economic sector as a whole and the skills development sector regarding the growth of the specific sectors and respective skills demand.

Jobless growth is a growing concern: Over 3 million jobs were created in Bangladesh during 2010-2013. However, only 1.4 million jobs were created during the duration in 2013-2016. There is a concern that Bangladesh may be going through a jobless growth which has already negatively impacted gains from the first 10 years of the demographic dividend.

Non-cognitive skills are essential for graduates in today's job market: Recent graduates in Bangladesh lack some critical soft skills as expressed by employers: (i) lack of critical thinking and problem solving abilities; (ii) gap in leadership and communication skills (both written and verbal in English and Bangla); and (iii) gap in values (value of time and ethics at work). This concern was echoed by university representatives. It was suggested that the training of graduates in soft skills should be part of the higher education programs. BRACU has introduced professional development courses to impart soft skills to graduates. New sets of technical skills are emerging and universities should be preparing graduates with these skills.

Standardized training and quality assurance of education/skills are critical: The various skills training programs require standardization and accreditation to ensure quality of graduates. For example, at BRAC University quality assurance of its programs is delivered through introducing some reforms in education management, e.g., established institution review board, standard operation procedure, soft skills training, innovative teaching methods etc.

Weak institution-industry linkages: University-industry linkages are absent in Bangladesh and this is one of the main reasons why employers don't get the graduates with right skills they need.

Attitudinal gaps among prospective employer and jobseekers: Often the attitudinal gaps among both job-seekers' and employers' lead to unfilled jobs. Job search platforms find that jobseekers often have unrealistic expectations in terms of the pay and working conditions. Employers have unrealistic expectations in terms of the skills they look for in their employee, compared to their payment structure.

Improving quality of higher education is essential: There are five critical elements that are required for creating a good higher education system and university, e.g. (i) brilliant teachers, (ii) talented students, (iii) good education administrator, (iv) innovative and relevant study programs, and (v) sufficient resources. These five critical inputs would be essential for a skills strategy to revamp tertiary education in Bangladesh.

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