Bangladesh: Improving Computer and Software Engineering Tertiary Education Project

Project Name	Improving Computer and Software Engineering Tertiary Education Project
Project Number	50140-002
Country	Bangladesh
Project Status	Proposed
Project Type / Modality of Assistance	Loan Technical Assistance
Source of Funding / Amount	Loan: Improving Computer and Software Engineering Tertiary Education Project
	concessional ordinary capital resources lending / Asian Development Fund US$ 100.00 million
	TA: Supporting Tertiary Education Projects
	Technical Assistance Special Fund US$ 500,000.00
Strategic Agendas	Inclusive economic growth
Drivers of Change	Governance and capacity development Partnerships Private sector development
Sector / Subsector	Education - Tertiary
Gender Equity and Mainstreaming	Gender equity
Description	The proposed project will help improve relevance and quality of CSE/IT programs in selected universities. It aims to increase job-ready graduates, increase R&D capacity through industry collaboration and interdisciplinary research projects, and develop technology entrepreneurships.

Project Rationale and Linkage to Country/Regional Strategy	Bangladesh achieved more than 6% annual economic growth since 2011 and recorded 7.9% economic growth in FY2018. The stable economic growth has been driven by exports in ready-made garment sector, stronger consumption, and public investment. Sustaining the economic growth requires diversifying the economic base and creating new sources of growth. Digital Bangladesh is an integral part of national development strategy since 2010 and the government expects information technology and information technology enabled services (IT/ITES) industry to make significant contribution to the economy. IT/ITES sector development will generate new growth opportunities, creating large number of jobs, increase economy-wide productivity, and improve service delivery through e-government initiatives.
	Bangladesh IT/ITES industry is in nascent stage of development, with two thirds of firms established after 2000. Most of the firms are small, with around 5% have more than 100 personnel. They are mostly engaged in lower end of the value chain. The industry faces several challenges among which lack of skilled human resource is the most critical constraint. The industry estimates that around 7,500 to 8,000 new technical personnel with tertiary education qualification is required annually. Many universities offer computer science and engineering and IT (CSE/IT) degree programs producing over 20,000 graduates every year, but with large variance in competencies and readiness for job. Overall, quality of new entrants is inadequate. Over 80% of job seekers fail in written test on basic coding skills, mathematics, and English. For mid-level skills such as testing, business analysis, and project management, the industry cannot find domestic talent and hires from neighboring countries at higher wages. This undermines business profitability and limits domestic talent pool.
	With increasing push for cost competitiveness and advent of Industrial Revolution 4.0, IT/ITES industry is facing enormous opportunities and challenges globally. Companies across world are increasing focus on research and development (R&D), speed of execution, product quality and services. Search for new-age skills such as machine learning engineers, application development analysts, back-end developers, data scientists, as well as upskilling and reskilling existing personnel are the top priorities for the industry. Tertiary level CSE/IT education in Bangladesh needs to meet these challenges.
	Absolute number of CSE/IT program seats may seem enough, but access to quality programs is limited as evidenced by lack of skilled workers in IT/ITES industry. Currently, CSE/IT programs suffer from outdated and limited laboratory facilities and are unable to cater new technology areas. Students also have limited laboratory time for hands-on experiences and practices, and laboratories are often in poorly equipped or maintained. Post-graduate programs are important to develop higher skilled human resource for technology leadership in industry, carry out R&D and nurture future faculty development. However, a high proportion of post graduate students drop out to take jobs due to high opportunity costs. It decreases supply of higher skilled human resources. While many universities and training providers offer short term courses for immediate job opportunities such as programming languages, existing IT professionals have limited opportunities for upskilling to keep the pace with the technological advances and global business practices. There should be better access to modern, quality educational facilities and short-term and long-term professional training programs for higher skills.
	Current CSE/IT programs are outdated, teaching method is teacher-centric and theory-focused, and assessment is largely examination-based. Changing curriculum is largely constrained by rigid academic governance practices. Increasing number of faculty members have higher qualification such as Ph.D., but there is a high degree of inbreeding and faculty members lack exposure to industry practices and technology trend. Faculty members have few opportunities in improving pedagogic skills and adopting modern approaches in technology education. Introducing new curricula is also constrained by lack of physical facilities, especially purpose-fit laboratories. Hands-on practical sessions are critical for core technical competencies such as problem-solving skills and use of IT equipment and applications. Practical sessions constitute less than 30% in public universities. This is even less in private universities (footnote 2). Currently, only a few universities have adopted international quality assurance system. International accreditation will help universities continuously align their academic programs with international standards that reflect industry requirements and technological changes.
	There is no requirement for industry participation in academic program design and course delivery. Students are poorly informed on industry requirements. Few universities have internship programs. Assessments are mostly about knowledge, and soft-skills such as collaboration, communications, analytical thinking, and creativity are not given priority. R&D activities in university are limited due to lack of funding, little incentives for faculty and students, inadequate number of post-graduate students. Current research activities are driven by faculty members' academic interest and may not reflect industry interest or provide solution to industry problems. Interdisciplinary R&D should be emphasized to encourage innovative IT solutions for management, medicine, manufacturing, infrastructure development, environment, and various services. Globally, universities became hub for technology startups leveraging knowledge and talents of university personnel with strong industry linkages. However, Bangladesh universities lack resources, knowhow and industry linkages to support startups.
	While gender parity has been met in primary and secondary education, only 31% of university enrollment is women. As in other countries, fewer female students are enrolled in technology areas in Bangladesh due to gender stereotyping. In addition, IT/ITES industry jobs requiring odd working hours and late stays discourage female students and workers from pursuing CSE/IT programs or IT/ITES industry careers. In public university CSE/IT programs, female students are 25%, but in IT/ITES industry, 19% of entry level workers are women. This ratio drops to 16% of overall human resource indicating low retention rate and career progression among female workers (footnote 2).
	The government prioritizes tertiary education to lead the economy to a new growth trajectory, especially in IT/ITES industry. Demand for quality CSE/IT graduates is high, as evidenced by high job placement rate at 77% and gross monthly salary of Tk40,000 to 50,000 among graduates from top 9 universities in Bangladesh (footnote 4). Out of the 9 universities in CSE/IT, one private university and three public universities including one regional were selected to implement high quality and industry-relevant CSE/IT education. These are University of Dhaka, Bangladesh University of Engineering and Technology (BUET), Jessore University of Science and Technology (JUST), and East West University (EWU). The universities will build upon the strengths in CSE/IT programs and leverage other existing faculties. The project will facilitate peer learning through joint activities and encourage competition especially on R&D and startup activities among the universities.
	ADB has been a long-term partner in education sector development in Bangladesh, especially in basic education and skills development. ADB currently supports primary and secondary education sector-wide approaches with emphasis on science, mathematics, English, and use of information and communication technology. ADB is assisting the government in expanding job-relevant training opportunities focusing on basic to mid-level skills linked with job placements through industry partnership. The proposed project will complement with ongoing education sector interventions by expanding quality tertiary education opportunities. It will complement the skills development initiative by filling the gap in higher skills and expand opportunities for more high-end upskilling and reskilling for IT professionals.
Impact	Increased utilization of information and communication technology to enhance markets and reduce transaction costs (Vision 2021)
Outcome	Tertiary level CSE/IT education improved to meet industry demand
Outputs	1. Modern learning, research and start-up supporting environment established
Geographical Location	Nation-wide

Safeguard Categories	
Environment	B
Involuntary Resettlement	C
Indigenous Peoples	C

Summary of Environmental and Social Aspects	
Environmental Aspects	
Involuntary Resettlement	
Indigenous Peoples	
Stakeholder Communication, Participation, and Consultation	
During Project Design	
During Project Implementation	

Business Opportunities	
Consulting Services	An existing TRTA hired 2 consulting firms and 16 individual consultants to provide technical inputs for project design.
Procurement	Advance contracting and retroactive financing are envisaged for civil works, equipment, long-term and short-term training for academic staff, research grants, project management cost, etc.

Responsible ADB Officer	Song, Gi Soon
Responsible ADB Department	South Asia Department
Responsible ADB Division	Human and Social Development Division, SARD
Executing Agencies	Ministry of Education Shikkha Bhaban, 16 Abdul Ghani Road Dhaka-1000 Bangladesh Ministry of Post, Telecommunications and Information Technology Bangladesh Secretariat Dhaka Abdul Gani Road, Dhaka-1000

Timetable	
Concept Clearance	18 Jun 2019
Fact Finding	15 Jul 2019 to 15 Jul 2019
MRM	15 Aug 2019
Approval	-
Last Review Mission	-
Last PDS Update	18 Jun 2019

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