

Rethinking engineering education in Bangladesh

MM SHAHIDUL HASSAN

DURING the twentieth century, engineering education in the developed countries underwent a remarkable transformation. Unfortunately, engineering education in Bangladesh has changed little though many new engineering fields were created since the emergence of Bangladesh as an independent country in 1971. In 1971, there were only five established engineering fields—civil, mechanical, electrical, chemical and metallurgical; the next five decades saw the creation of computer science and engineering (CSE), industrial and production engineering, naval engineering, water resources engineering, glass and ceramics engineering, petroleum and mineral resources engineering, biomedical engineering, mining engineering, genetic engineering and biotechnology, textile engineering, leather engineering and environmental engineering. Also, universities offering engineering programmes have grown rapidly since 1971 to produce engineers who could build complex technological systems and contribute to the economic development of the country.

Bangladesh University of Engineering and Technology (BUET) is the oldest engineering university in Bangladesh. Students who perform well in HSC come to this university to study engineering fields. But BUET has not been recognised as a world-class education provider. The education system at BUET is very traditional, with very little group work or practical work; the university has not changed the promotion criteria of faculty, endorsing good teachers for promotion. On the other hand, the world's most prestigious higher education institution, MIT in the US, is continuously changing teaching and learning techniques and promotion criteria (MIT report, March 2018). Why have changes in the teaching and promotion criteria become so important? Because, people in the business world are repeatedly telling us that the jobs of the future have not even been created yet, thus students need to know how to think, adapt, work together, and communicate.

Accordingly, the young population has to be equipped with the right set of skills to make them employable in the

fast-changing job market. For this reason, the education system (mostly traditional in nature) that we have for our youths needs to be revamped. Universities should target education designed for the industries of the future rather than the industries of the past. Therefore, undergraduate engineering education practiced at the undergraduate level needs renovation aimed at: (i) an educational approach that is underpinned by design synthesis and innovation; (ii) educational delivery that integrates effective and appropriate modern pedagogical approaches, supported by a flexible curriculum, and (iii) an educational structure that reflects the challenges facing engineering in the 21st century.



The most important change that we could make to engineering education to strengthen its role in society is to be increasingly sensitive to the needs of the students, and the skill sets that they will require to face the challenges ahead. Today's pedagogy is teacher-centred, not student-centred, as it should be.

The scholarly work going on in engineering education is not translated back into the lecture room. It is always theoretical. Our students are now fully aware of what is going to be needed from them in the future, and the skill sets that they are going to need. So, we should come alongside them in our education, giving them those skill sets. The curricula should emphasise the importance of student choice,

multidisciplinary learning, and its societal impact so that the students are exposed to a breadth of experiences outside the classroom, outside the traditional engineering disciplines and across the world. The globally accepted guideline for preparing curriculum is that the curriculum of an engineering programme is designed targeting some predetermined Program Educational Objectives (PEOs). Each has its own course learning outcomes (CLOs). The new curricula of undergraduate programmes call upon students to engage in exploratory and open-ended problem-solving and address challenges that affect multiple disciplines.

Universities such as Singapore University of Technology and Design

century—societal, environmental, and technological. Their governments are making major investments in engineering education as an incubator for the technology-based entrepreneurial talent that will drive national economic growth.

With an emphasis on interdisciplinary, hands-on learning and a strong connectivity with the industry, those universities also offer "a new future-oriented educational approach" designed to nurture technology-driven entrepreneurs and inspire future generations to follow careers in science and engineering. Each emerging university has nurtured an environment where creativity can flourish. The quality of its students bears testimony to the success of its approach.

SUTD was born out of the Singaporean government's vision to establish a new university that would be an engine for national economic growth, fostering talent and applied research in engineering, architecture and design. The Singaporean government engaged MIT in developing its undergraduate programmes.

The importance of engineers to any society has historically been of great importance, and that trend is only likely to increase over time. Engineers in Bangladesh can immensely contribute to the economic development of the country. If universities produce graduates with high-level skills and innovative quality, they will not only be successful at their jobs, they will also prove themselves as successful entrepreneurs and will create innovative technology-based businesses. Our universities must therefore adopt a radically different approach to undergraduate education. They may involve emerging engineering universities in developing their engineering education. However, the type of education that we want to have is expensive. The university authorities must be willing to make huge investment in developing and running new education systems. Universities also need to value teaching excellence, such as the quality and pervasiveness of faculty training in education or the extent to which education is recognised in faculty career progression.

MM Shahidul Hassan is Vice Chancellor, East West University. Email: vc@ewub.edu

Was it Vitamin A that made the infants sick?

Results of the probe committee must be made public

WE are deeply concerned about the report of a 16-month-old boy dying and several hundred children falling sick in Jamalpur Upazila allegedly after taking Vitamin A capsules during the latest Vitamin A Plus Campaign. More so, because it comes only a few weeks after a Vitamin A capsule campaign was postponed following reports that some batches of the capsules were found stuck to the packets they were in and could be damaged.

In the latest case, officials are saying that only children of one upazila seem to have been affected and that 2 crore children have been given the Vitamin A plus capsules without any incident. But the fact remains that a large number of infants have fallen ill and one has died after consuming the capsule, and until a conclusive investigation is done, nobody can assume that this will not happen again. It is not surprising that panic has spread among parents making them reluctant to get their children immunised. And for the officials to urge parents to continue to bring their children to the centres to receive the capsules and to say that there is no cause for panic is irresponsible, to say the least, when the probe committee's investigation has not been completed.

It goes without saying that such immunisation campaigns are essential in ensuring that our children are not afflicted with dangerous illnesses such as night blindness or low immunity (which Vitamin A prevents). But we are talking about the lives and health of infants here, thus every precaution must be taken to ensure that a drive to protect them from ill health does not backfire because due diligence in quality control and monitoring was not maintained. We urge the authorities to thoroughly investigate the incidents and make public the results of the probe before resuming the drive. This is the only way to quell any misgivings among parents and make such immunisation campaigns successful.

Don't let drive against land grabbing become pointless

Boost resources and manpower of RHD

WE appreciate the recent drive undertaken by the Roads and Highways Department (RHD) against illegal grabbing of land. However, as reported by this newspaper yesterday, the lands recovered by the authorities are soon occupied again by the grabbers, as there is no monitoring mechanism in place. If the department assigned to conduct the drive lacks sufficient resources and manpower, the entire operation risks becoming pointless.

As per this newspaper's report, the RHD in January knocked down approximately 1,700 unauthorised structures and reclaimed 35 acres of its lands. During the same period, according to the department's own data, nearly 1,500 new structures were erected while 20 acres of its land reoccupied. Officials at the RHD cite several reasons as to why they are not being able to sustain their success. Firstly, they say, they have extreme manpower shortage to carry out the drive, let alone monitor the department's lands. It has only four officers authorised to conduct drives in 10 zones covering the whole country. It also takes time to coordinate among several government and law enforcement agencies. What's more, some unscrupulous officials and politically powerful individuals help the grabbers occupy government lands. Therefore, it is difficult to take action against them. The officials already say they are under intense pressure and have even received threats.

That roads and highways are occupied illegally is a longstanding problem. It is often cited as a major cause for road accidents. Illegal structures also complicate city and town planning and cause sufferings for the people. While it is, indeed, commendable that the government is trying to bring discipline on the roads, it should also increase capability, resource and manpower of the relevant agencies so that the drives against illegal land grabbing do not become meaningless.

Haor development: From trade-offs to eco-friendly solutions

MOHAMMAD RAFIQUIL ISLAM TALUKDAR

THE ecosystem of the haors and wetlands in the northeast region of Bangladesh—including the districts of Sunamganj, Sylhet, Habiganj, Moulvibazar, Netrokona, Kishoreganj and Brahmanbaria—plays a vital role in ensuring our food and nutrition security and preserving the environmental balance of the country. There are a total 373 haor wetlands there that cover approximately 43 percent of the total area of the seven haor districts. The region is well known for its beauty and natural resources.

However, it is mostly populated by poor, disadvantaged and vulnerable groups of people living in flood-prone areas, and lacking access to basic services including education, employment opportunities and decent living standards. Road connectivity along with the transportation system is a serious concern here. In Sunamganj, for instance, there is no road connection between the Upazilas.

From the 60's until 2008, development initiatives taken in this region followed a model of "trade-off" between development for its human inhabitants and its environmental integrity. Even then, there were hardly any visible positive outcomes in the absence of well-integrated and cohesive development work. Since the 90's, however, environmental concerns in development initiatives in this area, as elsewhere in the country and even outside, became more prominent and drew theoretical intervention. As a result, Tanguar Haor, located in the Dharmapasha and Tahirpur upazilas of Sunamganj, was declared as an ecologically critical area in 1999, and as a Ramsar site—"a wetland site designated to be of international importance under the Ramsar Convention"—in 2000. The International Union for Conservation of Nature (IUCN) got the authority to protect the Tanguar haor in 2006.

The idea of a comprehensive development framework for this haor region emerged in 2009. A 2012 study by a not-for-profit public trust under the Ministry of Water Resources, the Center for Environment and Geographic Information Services (CEGIS), for formerly Bangladesh Haor and Wetland Development Board (currently Directorate of Bangladesh Haor and Wetland Development), presented a 20-year master plan for the area. Since then, development interventions and outputs continue to be seemingly visible. Furthermore, a 2017 study by CEGIS documents an impact assessment of structural interventions in haor ecosystem and innovations for solution.

The 2017 CEGIS study acknowledges that any wetland ecosystem is fragile and vulnerable, and haor-wetland is one of the major ecosystems of the country that necessitates a holistic eco-friendly plan for any development action to keep a harmonious relationship between humans and nature, which is also essential for the sustainability of the haor wetlands. Also, the global Sustainable Development Goals (SDGs) 2016-30 called for a departure from the "trade-off" police in development economics and instead sought "eco-

friendly" solutions.

The 20-year framework plan is being implemented on a short-, medium- and long-term basis, integrating the multifaceted development interventions including flood management, environmental sustainability, crop production, fisheries and livestock, expansion of education, settlement and health facilities, road communication, navigation, water supply and sanitation, industry, afforestation, and generation of power and energy.

The planned investment portfolio includes 17 sectors: water resources, agriculture, fisheries, pearl culture, livestock, forest, education, health, transportation, housing and settlement, water supply and sanitation, industry, energy and power, mineral resources, biodiversity and wetland, tourism and social services.

An eco-friendly integrated development approach, which would recognise the importance of optimising

collaboration, public-private partnership, public-private-research institute partnership, GO-NGO partnership, government-university partnership, and government-media partnership. Thus, the government must encourage more innovative and proactive proposals from the parties involved—public, private, entrepreneurial, media, non-government, university, research and advocacy institutes.

Furthermore, an expert commission needs to be built along with a set of quality, performance as well as achievement indicators and timeframe-based measurement tools. Also, more focused research and evidence-based advocacy, as well as innovations and innovative proposals need to be developed.

Recently, I had a discussion with XDsocial, a knowledge-based entrepreneurial and management company, to develop a public-private-research institute/university partnership proposal focusing on social contributions in large-scale local employment



Tanguar haor

PHOTO: SUJONCRISTI / WIKIMEDIA COMMONS

available resources of the haor region as well as a sustainable development of the potential of the area by incorporating all relevant social, cultural and environmental aspects, is a must here.

Being a member of the community in this region, I am thankful to the government for its timely policy initiatives, but the haor people would not like to see a repeat of fragile development interventions of the past or the shadow of any corruption. There should be a zero-tolerance policy against "paper-based" development—meaning, development works that exist only in papers, with no real-life outcomes.

A traditional approach cannot encounter the problem at hand nor can it address the need for the kind of development that is needed. This requires a multifaceted development operational modality with diverse and innovative engagements and wide-ranging partnerships including government-entrepreneurial

opportunity generation, food and nutrition value addition, and innovative reprocessed energy creation for the community. More such initiatives are needed. Such people-centric as well as eco-friendly creative thinking and proposals need to be continually appreciated and supported by the government.

Certainly, the people are the ends and means of any development initiative, and eco-friendly solutions are needed for sustainable development. We do not want mindless development in the haor region. The development must be eco-friendly so that it will have no adverse effect on the future generation and indeed the vital ecosystem of this region.

Mohammad Rafiquil Islam Talukdar is a researcher on governance, development and political economy, as well as Associate Professor (Government and Politics) and Director (Research) at Asian University of Bangladesh. Email: rafiquil.talukdar@gmail.com

LETTERS TO THE EDITOR

letters@thedailystar.net

Implement the ban on coaching and tutorship

The High Court has recently ruled in favour of a government directive that banned school teachers—both governmental and non-governmental—from owning or being a part of any coaching centre. In addition, teachers have been restricted from tutoring their own students outside the school or classrooms.

The step was taken to address the conflict of interest associated with the practice. It is often heard that some teachers force their students to take private tutoring from them or else they receive poor grades in exams. It is also reported that as some teachers prioritise private tutoring, they tend to neglect classroom teaching. In the process, even primary school students are compelled to attend coaching centres.

We hope that the HC ruling will be implemented without any delay. At the same time, the working condition, salary and other benefits of school teachers must be taken into consideration, and improved where necessary, for a better impact. Zabed Wali, Chattogram