

Higher Education of Bangladesh to Meet the Challenges of the IR 4.0

Md. Kabir Hossain¹, Mir Md. Rahmatullah², M. M. Musharaf Hussain³

¹Assistant Professor (ICT), Bandarban Cantonment Public School & College, Bandarban, Bangladesh.

²Level:4, Semester:2, Faculty of Fisheries, Hajee Mohammad Danesh Science & Technology University, Bangladesh

³Professor, Dept. of Computer Science and Engineering, University of Creative Technology Chattogram, Bangladesh

Abstract - The Fourth Industrial Revolution (IR 4.0) calls on us to think creatively about production processes, value chains, distribution and customer service processes. Meanwhile, the future of education emphasizes the immense need to look beyond these areas and strategically use the "Internet of Things" to prepare the upcoming workforce for the challenges ahead. Universities emphasize their role in shaping future technologies by experimenting with innovations and educating future generations. Traditional education has greatly contributed to the current level of industrial evolution and technological advancement. However, for higher education to equip future generations with the right skills and knowledge; a question that remains is how higher education institutions will be affected by the Fourth Industrial Revolution and how they will shape themselves in education.

be possible to accelerate the fourth industrial revolution by higher education.

2. Background of IR & Higher Education

On December 16, 1972, on the first Victory Day of Bangladesh, he initiated the development of a knowledge-based economy by establishing the UGC through the President's order. In 1973, the activities of UGC officially started. Bangabandhu Sheikh Mujibur Rahman dreamed of a hunger-free and prosperous 'Golden Bangla'. Carrying the same philosophy, the country has been transformed into 'Digital Bangladesh'. Vision 2021, Vision 2030, Vision 2041, Vision 2071 and Delta Plan 2100 have been adopted to achieve the status of a safe, developed and innovative country.

Key Words: Industrial Revolution, Higher Education, TVET, Curriculum, IR 4.0, IoT etc.

1. INTRODUCTION

Universities are the front line institutions to meet the challenges of the fourth industrial revolution. Universities should work towards that goal. Let's start with an example. One day I went to seek admission in a government polytechnic institute. We have a variety of admissions inquiries which are limited to a few specific questions. I saw that using this concept, the institute placed a robot in front of the admission office. This admission assistant robot is helping the incoming people by listening and answering their questions. Every day many admission-seeking students and parents attend there and try to get similar information. The robot assists the admissions officers by answering these same questions. The robot is very efficient in this work. Artificial intelligence is now being used to create ideas for business success; robots are being used in the apparel industry. The Fourth Industrial Revolution is no longer a dream but a reflection of reality. We should capitalize on everything we have and move quickly. The breakthrough role that countries want to take in the Fourth Industrial Revolution can be made possible by changing the traditional way of higher education. The growing development and acceptance of Massive Open Online Courses (MOOCs) will strengthen higher education standards and provide much-needed fuel to quality education indicators. If "Global Identity" and "Education for You" are adopted globally in the implementation of Global Education like Global Village, it will



Fig -1: Most of the important elements of the 4th Industrial Revolution

Achieving these goals will only be possible when we can promote high-quality teaching and research and create an innovative education ecosystem. For this purpose, the University Grants Commission of Bangladesh (UGC) has organized an international conference on "4th Industrial

Revolution and Beyond (IC4IR) 2021". On the birth centenary of the father of the nation and the golden jubilee of the country's independence, a high-level international forum will be created to bring together researchers and practitioners to help us to solve local problems, improve lives and environment and achieve the Sustainable Development Goals using the techniques of the Fourth Industrial Revolution. The forum will in future deal with topics such as artificial intelligence, robotics and automation, IoT and smart agriculture, data analytics and cloud computing, communication and network signaling and natural language processing, among others.

3. Ranking of the universities in Global Aspects

The ranking of our universities in various global indices is not quite acceptable. According to the latest Times Higher Education Ranking 2022, only three universities in the country are included in the global ranking. Dhaka University (801-1000), Bangladesh Agricultural University (1001-1200) and BUET (1201+). In 2022, 13 universities of the country have been included in the Asia ranking. In digital Bangladesh, we should emphasize the following points in our higher education vision to meet the challenges of the fourth industrial revolution.

Bangladesh has already passed the first stage of digital education i.e. face to face digital and now we are in the second stage of digital education i.e. blended digital. For this, the UGC has recently approved the Blended Learning Policy 2021. The next step is online digital education. Bangladesh is yet to establish its competitive position in the global online education industry. Its market value is 375 billion dollars by 2026. It can easily be our third highest source of income after expatriate income and readymade garment industry. In this case, technologies of the fourth industrial revolution (such as artificial intelligence-based LMS, learning analytics) must be effectively integrated into the system. Even neighbouring India has started recognizing online degrees. This has been done for at least 10 years in the developed world.

4. Model of TVET and Structure of the Curriculum at Bachelor's Degree

To face the 4th industrial revolution B.Sc. Curriculum must be specific and subject oriented. The curriculum should include content that will provide a graduate with the skills necessary to practice as a teacher in a university of engineering and technology or any other institution. Subjects taught may be classified into vocational academic subjects, technical subjects (in specialization), mathematics and natural science subjects, humanities and other related subjects, and technical projects and reports. This will enable both teachers and students to survive the 4th Industrial Revolution with competence. This type of curriculum should be designed with the following information and data in mind.

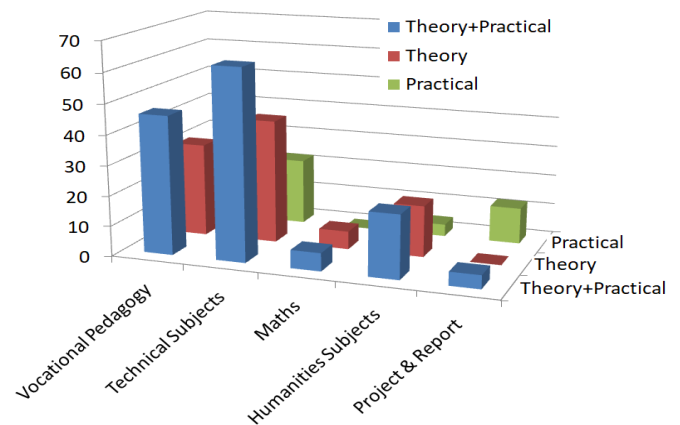


Fig -2: Distribution of contact hours

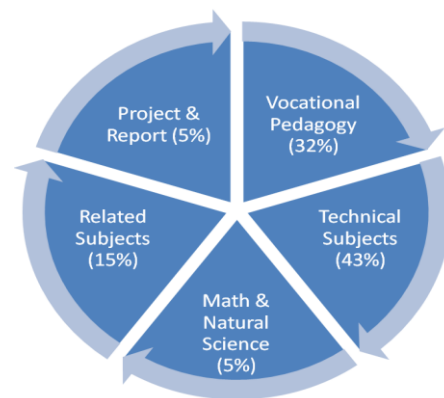


Fig -3: Distribution of credits

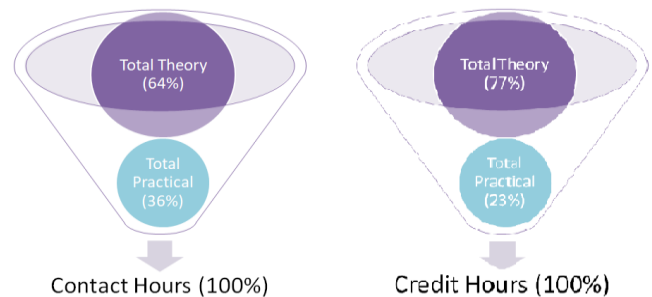


Fig -4: Ratio of theory and practical component

5. Inclusion of TVET Components in Undergraduate Curriculum

Every university graduate should have a vocational component as part of their curriculum to prepare them for the future world of work. Examples could be automobiles, electrical wiring, graphics, video editing, and animation. It is true that there are many unemployed graduates in the country, but they do not have to wait for jobs if they have vocational skills; rather they can create job opportunities for others. Even online digital education can open thousands of job opportunities like teaching assistant, learning advisor, instructional designer, learning technologist. Many jobs will

be lost with the advent of the Fourth Industrial Revolution. But more than that, new jobs will be created.

One of the main reasons for the poor ranking of our universities is the low number of international students. It is only 3 and 0 percent in two top institutes of the country. In contrast, most Australian universities have about 40 percent international students. Having foreign students generates billions of dollars annually and contributes significantly to rankings.

Many of our university curricula are outdated. It is often not created or updated based on needs. BCS centric education will not help us in long run. A large gap between academia and industry is evident and needs to be addressed in our curriculum. Should students engage more with practice in industry in the final year of an undergraduate or graduate program, there may be a capstone project or thesis option. One or two university courses may be offered online if needed at that time. Government and private sector should come forward in sponsoring such initiatives.

Soft skills, such as communication skills, language skills, cognitive or emotional empathy, time management, teamwork, leadership qualities are very important for employment. It can mainly ensure job placement (local or international), freelancing, consultancy profile development, business development guidance and IGA (Income Generating Activities). Besides Bengali and English, third language skills can prove very useful in employment.

Higher education can have different schemes, such as completely free, government-subsidized and full-fee, which can be paid based on the taxpayer's income. Governments can further subsidize Fourth Industrial Revolution-related courses and programs based on their demand in the local job market. When students get a job or become an entrepreneur after graduation, they have to gradually pay off their student loans. In order to get government loans or subsidies, students' parents or guardians must file an income tax return, even if it is nil.

7. Poor Position in University Rankings and its Remedies:

University ranking is an important factor. This ranking is done every year. Recently, the UK-based organization Quacquarelli Symonds (QS) published the ranking of the best universities in the world-2023. On June 8, the list of the world's best 1,400 universities was published. But no university of Bangladesh was included in the top 500. However, 9 universities from neighboring India are in the top 500 list. Even Pakistan has 3 universities in the top 500. But the economic infrastructure of Pakistan is much weaker than that of Bangladesh and the condition of their country is not so good. But we are doing so well economically why not one of our universities is in the top 500. There is a lot of criticism about it. Criticism is, of course, justified. The government

needs to think about this, why the university is not in the top 500. After looking into the matter, it needs a researched solution. In 2012, Dhaka University was ranked 600, but now it is falling behind in the ranking. This is disappointing for us. Because, everyone believes that no development will be sustainable if there is no improvement in the quality of education. If the development is to be sustainable, the development in education, the allocation for research should be increased. Education cannot play a significant role in the overall development of the country if there is no great improvement in research or quality research.

The government needs to take effective steps to ensure that our universities can quickly rank in the top 500 in this world ranking. Students are also very worried as teachers are embarrassed why none of our universities are in the top 500. But there are many reasons behind this. In this ranking, QS evaluates universities by dividing 100 points into 6 indicators. Among them, academic reputation is 40, reputation in the job market is 10, teacher-student ratio is 20, teachers' research is 20 and international teacher ratio and international student ratio are considered as 5. But we are far behind in these indicators. Because universities do not track how many students are employed against a teacher. For example, according to international standards, one teacher will be employed for every 20 students. But in reality many of our universities don't accept it or don't have it. It is alleged that the University Grants Commission does not grant concessions to teachers as per the criteria. For example, Chittagong University has 27,550 students and 907 teachers. The average teacher-student ratio stands at 30.37. That is, there is 1 teacher for 30 students. If you take the data, it will be seen that in many new universities there is only 1 teacher for more than 30 students. There are hardly any foreign teachers or students in our universities. In this regard, the university authorities quickly made a policy so that foreign students can be admitted and some foreign faculty members can be appointed. Financial incentives should be given to teachers for quality of research and quality of research should be linked to promotion.



Fig -5: Times Higher Education Ranking Methodology

Apart from this, research allocation should be increased in the university budget. Allocation to education should not be seen as expenditure but as investment. Then development of education and research is possible. Academic reputation, good quality teachers should be appointed to increase the reputation in the job market. Now I see that the authorities are appointing teachers with special qualifications in the university, which is not desirable in any way. Stopping these is the demand of time. It is not right to make any kind of compromise in the recruitment of teachers. 100% transparency should be ensured in the recruitment of teachers. Vice-Chancellors should be more careful in appointing teachers and stop nepotism.

It is time to think deeply about how universities can be positioned in a specific top 500 list. To do that, every university should have an academic master plan. In order to improve the universities in the basic indicators, the most talented students should be appointed as teachers first. Rules should be made, teachers cannot be appointed without research. Apart from this, Master's degrees are widely given in the universities of our country. It's not right. Because not everyone needs a master's degree. Granting research-based degrees to those pursuing Masters will increase the number of university researches and the quality of teaching, which will help to enhance the academic reputation of the universities. If teachers do not give importance to PhD and post-doctoral research, it will be difficult for our institution to get a place in university ranking. The University Grants Commission and the University Administration should take very quick steps to increase the teacher-student ratio in establishing international standards.

Higher Education and Research Commission should be set up as soon as possible, so that the quality of university teachers and teacher research can be improved. I believe that to get promotion at every step from assistant professor to professor of the university, there should be research of international quality with PhD degree, it is necessary to make such a rule, which will work to get a place in the ranking of the university. It is absolutely necessary to stop dirty politics and create an environment of constructive politics in the university. Dirty politics seems to be largely responsible for the university's lack of place in the rankings.

One of the major reasons for the poor ranking of our universities is the low number of international students. It is only 3 and 0 percent in two top institutes of the country. In contrast, most Australian universities have about 40 percent international students. Having foreign students generates billions of dollars annually and contributes significantly to rankings. With their own funding arrangements, universities can bring in visiting professors and scholars from abroad, especially those of Bangladeshi origin who have academic excellence in teaching and research in various fields. As a result, the quality of education will change.

Universities should have a national ranking system following the Times Higher Education (THE) or Quacquarelli Symonds (QS) rankings. This will create a competitive but conducive academic environment for teachers and universities. Criteria for institutional promotion and annual increments, such as academic excellence, professional development, quality publications and research grants need to be followed and strengthened in a systematic manner with transparency.

A report by the World Economic Forum (2016) indicated, '65 percent of children entering primary school today will eventually work in entirely new jobs that don't yet exist.' So education is not a tick, but a lifelong achievement. The jobs of the future will be those that cannot be done by machines. At the same time areas like creative endeavors, social interaction and physical skills should be developed. Humans can defeat machines. Now our policy makers should rethink the education policy by prioritizing research and innovation related to the fourth industrial revolution, so that Bangladesh can emerge as a brand in the global education market.

8. CONCLUSION

Educational institutions can create a platform for developing young innovative talent such as high-level experts, scientists and technicians by preparing lesson plans tailored to Industry 4.0. Providing appropriate education to the future workforce is critical and many researchers predict that IR 4.0 will require profound changes in key aspects such as education content, delivery, pedagogy, structure and management of education. By creating this kind of constructive change, young people with innovative talents can be harnessed to become indispensable manpower for any country. Then the country and the nation can enjoy the benefits of IR 4.0

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