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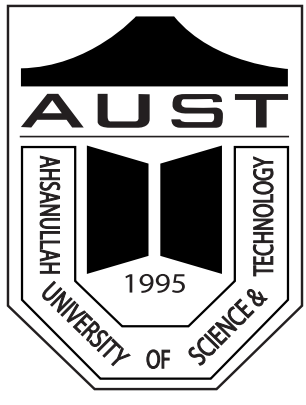

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Speech of Convocation Speaker

Prof. Mohammad A. Karim Ph.D.*

Distinguished Guests on the Platform, Honorable Minister of Education, Chair and Members of the Board of Trustees, Honorable Vice Chancellor, and most importantly, Today's Champions - Students who are About to Graduate.

Assalamu Alaikum. Good Afternoon!

I am honored and privileged to be asked to join you, the graduates, their parents, and families at this celebration of their achievements today.

I shall be talking about future workplace and the educational challenges that lie ahead. For me, that journey began some 60 years ago. As such, I will indulge myself in citing my own journey to elaborate my own turns and twists while chasing my own future of work.

World's first company – East India Company - was established in 1600. It was formed primarily to trade spice. The company waffled and nearly failed while operating in the Island of Java. Its spice ships – on way – between Java and England would typically dock at Surat, India. In 1757, this company asked for trading rights - this time from Mughal Emperor Jahangir. The company ended up ruling, first, Bengal and subsequently India in less than 100 years and ruled us all for another 90 years. In time, that very company rose to account for half of the world's trade. At its peak, the British East India company had a private army of about 260,000 — twice the size of the British Army. That was the beginning for us all – English began to slowly replace Farsi with English finally becoming the language for higher education. Native English speakers, not surprisingly, will make up only 15% of the estimated 2 billion people who will be using English in 2020. Most conversations in English today are often between non-native speakers. For Indians today, for example, English is an ethnically neutral choice that avoids the conquest of one Indian culture or language by another.

As early as Year 2000, while visiting a microelectronics start-up in New Jersey, I came to understand that speed of engineering design was about to be tripled. Each day, at the end of the day in New Jersey, the engineering design was getting transmitted to another bunch of engineers some 8 time zones away. And, after being reworked for another 8 hours, the reworked design was then getting forwarded next to yet another destination another 8 time zones away. In 24 hours, the microelectronic designs will have gone around the globe, across the oceans, multiple satellites, networks, and servers, through 3 teams of engineers at three different global locations – each with a distinct sets of culture, language, and work habits before it was back again in New Jersey the next morning at 8.

But that was then. Today, we are seeing rise of companies the likes of which we have seen never before. In a recent Study titled "the Future of Degree," its author Jeffrey Selingo claimed: "Human knowledge is doubling every 13 months, on average, and IBM predicts that in the

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Note : *This Speech was delivered on the Occasion of 10th Convocation of Ahsanullah University of Science and Technology on 09 January, 2018 at the Bangabandhu International Conference Centre (BICC), Sher-e-Bangla Nagar, Dhaka.*

next couple of years, with the expansion of the internet of things, information will double every 11 hours." You here today, and us there beyond the Atlantic and everywhere else are beginning to see now new realities – that are dramatically different.

"Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, creates no content. Alibaba and Amazon, the most valuable retailer, has no inventory. And AirBnb, the world's largest accommodation provider, owns no real estate or hotels. Clearly, something strange is happening. These unusual developments prove that there's a growing trend in companies dominating their respective industries without necessarily 'owning estates' or tangible assets.

The average person in US changes jobs an average of 12 times during his or her career. Some of these jobs and workplaces are yet to be established using technologies that are yet to be dreamed of. Not surprisingly, employers and universities are all focused on acquiring transferable skills relevant to jobs that are yet to be born. It is all about TRANSFERABLE SKILLS and answers to the following set of questions. Are we ready to teach students how to teach ourselves again and again? Do we know that more significant problems of the society today will require many different folks from many different disciplines and fields to work often concurrently? Do we know how to work in teams? Do we know how to be flexible? Do we know how to communicate effectively? Do we know how to conduct real research? Do we know how to design complex technology or processes?

A large number of university students, even in the USA, end up studying X instead of Y often because of pressure from the family or parents. More often than not such students become reluctant experts in X rather than becoming passionate experts in Y someday. Studies reveal that other than having possible short-term pay-back, such students rarely contribute to innovations and/or discoveries.

More often than not one who goes after his/her passion in Y ends up

1. Seeking Passionate Faculty Members

2. Diving Deep Into a Research Project

3. Going On a Transformative Internship or Study-Abroad Experience

4. Being Creative. Taking Risks. Learning How to Fail.

While previous generations of students usually had to settle for their initial choice of major (and therefore career), today's competitive landscape offers students with unprecedented flexibility.

Universities of the Future will need to anticipate students having changes of heart. A growing number of universities including my own in Massachusetts offer incoming students the option of participating in an "undecided" program. Over the course of one's first year, one can sample introductory courses from a variety of college majors, eventually choosing a major that one likes before the end of your second year.

Universities of the Future will Need to Stop Preparing Tomorrow's Workforce With Skills for Yesterday's Jobs

One of the major challenges that US Universities in particular have been engaged with is how best it should be *Using Data to Improve Student Outcomes*. At UMass Dartmouth, for the last four years or so, we have been using 10+ years of past student data, grades, scores, study habit, and course sequences to figure out which student with which background can go through which hurdle more appropriately so as to be able to complete his/her chosen degree programs or seek/transition into a new one without falling behind too far or provide appropriate tutorial assistance at appropriate moment to help overcome student's respective challenges.

I am a firm believer that God always opens doors for those who are patient – *watawa sawbis sabr*. Too many people fail to notice "open doors to the future." I, as an individual, must have missed some of those doors as well. Each time a door was opened and I was able to realize it, I was able to then sneak through it. Once I was in through that door, more often than not it opened often to another door later and then another.

Unlike most, I was fortunate to be different, i.e., a risk-taker and be willing to fail. While in Bangladesh, it took for me to have a leap of faith, however, in US, it was easier to have a change of heart. Since my 12th Grade, I have had quite a few interesting, relatively unconnected, work experiences in both Bangladesh and US as a student and then after another 32 years and 9 universities later, I get to now be part of a major research extensive university in Massachusetts that has eight colleges offering over 50 undergraduate majors and 45 professional and doctoral programs. Each experience, hiccups, and many failures in both Bangladesh and the US, I am certain, did expand my heart further. *Rabbi Zidni Ilma*.

Some 60 years ago, the future work, which for me, is here today and the next few years of my working life, like thousand others in Bangladesh, started in a village school in rural Sylhet. For at least two years, this primary school met under open sky - rain or shine. If rain or thunder came down hard, we would just stand under the big tree hoping it would pass and if didn't we would be bundled up with those others in the School who had a roof of sorts over them. Flexibility and adaptation to changes were the key drivers.

My educational paths had many twists and turns. Had I stayed at Faujdarhat Cadet College for another 2 years, I would have tried Air Force. My father had a different vision for me – he got me out of Faujdarhat to make me pursue pre-medicine. During my Higher Secondary Certificate, I took Biology – not mathematics. It is during those years I became fascinated by the many possibilities in physics. In 1972, at age 19, I was about to leave for the Soviet Union to study Geophysics but was forced to abandon it altogether thanks to interference by the then Communist Party of Bangladesh.

A curiosity I had during the 11th Grade revealed some interesting astrophysical problems. I was yet to learn vector calculus, tensors, and partial differential equations. I also didn't know yet that a little learning is often a dangerous thing. With my limited mathematical knowledge then I miscalculated the dimension of universe. I found it be roughly a factor of 10 larger than what was known then - 10 billion light years. I was so excited about my finding that I ended up writing a letter to Professor Abdus Salam (then at Imperial College of Science and Technology in England). This was eight years before he received his Nobel Prize in Physics, along with Steven Weinberg, for their work on unified electroweak theory. What was profound is not that I had the audacity to write to him in 1972 - describing what I thought to have uncovered; but that Professor Salam, actually bothered to go through it. Professor Salam engaged, in turn, a different physicist to give a response to my query from Germany. The answer was too complex and too mathematical for me to understand in those days – it showed that I was wrong in my estimation and that I am yet to learn real mathematics. There were three great lessons for me from this opening of doors. First Lesson, great men such as Abdus Salam never ignores serious question – even if it came from some one whose age was only Nineteen. "Question" is often the key to finding "answers." Second Lesson, Great man don't hesitate from seeking opinion of others. Third Lesson, I really needed to learn and study a lot more. Real answers require real preparation. These three unique lessons remained stuck with me in my brain for rest of my life.

I settled for physics at Dacca University in 1972, however, was soon disillusioned by the ongoing politicization of Dacca University that was engulfed soon by the now infamous Dhaka University Ordinance of 1973. I had no desire left to continue as the university was

fast getting disintegrated and then on April 4, 1974 seven students in Mohsin Hall were assassinated in cold blood by political thugs.

During the undergraduate years at Dhaka, I realized that there wasn't much of any publications or books available then for people such as I. This realization led me to write roughly 35-40 major popular science articles that appeared either in *Bijnan Shamoeeki* or *Bangla Academy Bijnan Patrika*. Towards the end of third year, I had assembled a large number of my already-published articles on cosmic and biological evolution in the form of a book manuscript. I submitted it to Bangla Academy for publication. I was still an undergraduate student – didn't really have the profile or age of author of any serious book. I would go to the Academy off and on to enquire and waited eagerly for about a year. Bangla Academy personnel were either unwilling or lacked the courage to tell me anything – good or bad. I was hoping that at least they would tell me the shortcomings, if any, of my manuscript and I could then either correct it or improve it. This was a great, great disappointment for me.

When time came to leave for the United States in 1976, I went and collected my manuscript from the Academy. I swore that I was not going to look back at the Academy but look ahead. Today, with having authored 20 or so books on science and engineering that are used by others throughout the world, I think my Bangla Academy experience made me a much stronger person.

I left for USA to pursue graduate studies in biophysics. An amazing interaction with a professor of quantum electronics (Ichiro Miyagawa) in 1978 caused me to switch to electrical engineering to do a second MS and then a PhD. While a student of Electrical Engineering, I worked on all-optical image processing. But, thereafter, I continued to move on to other areas of research based on opportunities that appeared before me. I preferred to be a risk-taker and willing to fail.

One thing I learned quickly is that it's impossible to connect the dots looking forward. But it was very, very clear looking backwards only a few years later. My dear young friends, you can't connect the dots looking forward; you can only connect them looking backwards. So, you have to just trust that the dots will somehow connect in your future. You have to trust in something - your own guts, hard-work, and being both faithful and patient. This approach has never let me down, and has made all the difference in my life.

I was blessed with amazing graduate students with profound curiosities to learn from – including quite a few from Bangladesh. Together, we generated newer ideas and synthesized newer solutions. My students and I thrived on asking questions – not for the sake of asking questions – but for finding answers. I believe that it is by teaching that we teach ourselves. Most of my research articles as well as a few of my books are co-authored with these brilliant students. Many of them in time have been elected fellows of multiple professional societies. What a ride for them? And, what a ride for me with them?

Success will not be measured by how rich one is– or what kind of a car will one be driving – or what material or gadget one would be possessing. It will be measured by how serious we are in our learning – how early we shall get up every day and begin to work – and how late we shall stay up to work – not because it is asked of us – but because we enjoy doing it.

I thank you all for this opportunity to talk to you. I thank the professors you got to reason with - often daily. May God show you all the way ahead. It is for people who can figure out where is the door, when it is about to open and imagine what may lie beyond the door. Go for it.

Thank you.