



Prof. Ashok Jhunjhunwala

PADMA SHRI

Institute Chair Committee

Indian Institute of Technology Madras

MESSAGE FROM THE HONORABLE CHIEF GUEST

Dear Subodhji, Timothy, members of Board of Directors and faculty of IIT Mandi, I thank you for inviting me to this august occasion. This is day of celebration for the graduating class of 2018. I remember coming here some three to four years ago, when you had just moved to this new campus, and infrastructure was just getting ready. Heating was not perfect and walkways were difficult. I had an informal meeting with some of you, where you expressed some unhappiness. I had told you to be patient; as in years to come you will be part of a history on how a great IIT was built in this remote corner of the country, in the middle of Himalayas. Looking at this institute today, I will say that you have already created the foundation of a great IIT. You have played an important role (and faced some hardship) in creating this institution. I hope you have etched your name somewhere. When you come back fifteen years later with your children, you would be able to show your contribution to this institute. You will be indeed proud.

Traditional Indians have divided a human-life into four stages: Brahmacharya (student), Grihastha (householder), Vanaprastha (retired) and Sannyasa (renunciation). In today's time, it probably has collapsed into three stages. The first remain the Brahmacharya (or student life, where you grow-up and learn), and today marks the end of this first stage for you, for the class of 2018 of IIT Mandi. I offer my heartiest congratulations to each of you for successfully crossing this stage and very best wishes for a meaningful future. I specially congratulate the medal and prize winners who have worked hard and have succeeded.

Tomorrow you enter the second stage of human life, which is a period where you will be "contributing back to this earth and society." In today's time, it typically lasts for about 50 years. From now on, you will enter in this real world, as an independent person, responsible for yourself, for your family, for your nation and for humanity at large. In Indian tradition, it is said that a human being is born to contribute to the earth. "Karma," is the purpose of one's life. It is

this which makes your life meaningful. I have been in this stage for over 40 years now and can say from my personal experience, that it is indeed true. If you lead this part of life well, you will be a satisfied person. So while your formal education is getting over, you can consider this as the real-examination, the examination of life. Your performance here will be a measure of how well you have learnt at this institute.

You are fortunate to graduate at a time when our nation is poised to grow out of its past and become a stronger nation. Each of you will indeed enjoy this, but have a special role to play and owe great responsibility in getting us there. Let me say a few words which may help you in this journey:

1. The first one may be a redundant advice, as many of you may have already acquired considerable soft-skills. You need to be able to speak out in meetings, in conferences and in public without any hesitation and communicate what you want to say. It requires certain will and practice. It is easier to learn at this age. It will help you over the next 50 years. I am saying this from experience. I barely could speak in English when I graduated. I worked on it so that I could communicate well in meetings, in a class and in conferences. The clear and bold communications stood with me better than practically anything.

2. I was fortunate to be taught by some of the greatest professors of my time at IIT Kanpur. Prof. C N R Rao taught us half-life of elementary particles. During the discussions, he mentioned that even knowledge has a half-life; then he went on to say that whatever he was teaching us, had a half-life of about 3 years. So by the time we graduated, two third of what he taught us might become obsolete. He therefore advised us to not just learn what he and other teachers taught us, but prodded us to keep learning throughout our life. That was the only way that our knowledge will not become obsolete. My second advice to you is precisely that. I am sure that your college and teachers here have taught you a lot. But never stop learning in your life. The knowledge that you have acquired here will become obsolete someday; you need to learn new things. If you want to succeed in your life, keep learning all the time from your colleagues, from your friends, from your juniors and tomorrow even from your children. Today you are fortunate that you can also learn from the Internet. The day you stop learning, you will become obsolete.

3. You have to live and contribute to this nation for the next fifty years. A lot will change by then. A lot will be for better. For example, renewable are likely to become the dominant source of power. Solar and wind, rather than fossil-fuels will become dominant. You will see this in the next ten to fifteen years. You have to watch it happen and facilitate this. There is still a lot to be done in this area. A lot has to be done in the area of energy-storage to enable renewable become the dominant source of energy for the nation and the world. And you can dream of a fossil-free future, probably the only way the earth will have a future. You need to make this happen soon.

4. Similarly, by around 2030, most of India's vehicles will be running on Electric power. This will be a great disruption. Today 7.1% of India's GDP comes from auto-sector. The processing

and distribution of transport fuel contributes to another 5%. This 12.1% GDP and millions of jobs associated with them will be under threat. The transition will not be smooth and if this is not handled well, it can result into major problems for our nation. You are walking into the beginning of this transition. This alone will free India from being dependent on massive oil-imports and also from the huge pollution that petrol vehicles create. Your knowledge and skills, honed by this institute, could make a difference. Robotics, 3D-manufacturing (also called additive manufacturing), nano-materials have all arrived and is going to transform the society. The world will require and come up with new materials. Electric aircrafts will not be too far behind. You indeed are getting into fast-changing world. Your ability to learn new things, train and adopt yourself quickly, can get you to lead the world. Best wishes for that.

5. But not all the transformations will be good. One of the biggest problems that you will face in near-future is “water-problem” in the world. Availability of water will be probably the world’s biggest challenge. And India will face this faster than others. The only way out is to recycle every drop that we use, preserve water and clean water. It would require technological breakthrough and some serious management effort. If we do not solve the problems, you will see water-wars in your life-time.

6. Another related problem, especially for India, will be India’s waste disposal. Swatch Bharat will remain a slogan, if technologies and processes are not developed and used extensively. Quick-fixes will not work. World has to become truly sustainable. It will be a great challenge. But I want to stress that five years back, it did not appear that we can make renewable energy economical and now we have done it. Keep in mind that determined human beings can indeed use technology to transform. So you can solve the problems of water and waste in near future. You have to just be determined.

7. There is another great technological advancement in recent years. This comes from Artificial Intelligence (AI). I have seen work going on in the area for 30 years, with limited advancement. It all looked far. Then suddenly things changed in the last few years. We saw some breakthrough in some specific areas. The gains quickly spilled over in others, and now there is a flood. Huge number of people and start-ups has emerged into this area. Investment is pouring in. Data Analytics and learning is now being applied in wide-varieties of field with definite gains. The gains will grow exponentially in future. While there are definite gains in businesses and services, the fear is that it may imply making large number of jobs redundant. Why employ people when machines can do it and do it better? What will happen to these large numbers of people who becomes redundant? This is the challenge that nations will face. Only the best will survive. This is indeed a serious problem that you will encounter and the solutions have to be found sooner rather than later. There is another dooms-day scenario being painted. How long will it take the machines to become more intelligent than human beings and will they take over? While it is still in domain of science fiction, ignoring this any longer would be disastrous.

8. Yet another challenge that you will face today is that our nation is unfortunately passing through considerable social-strife. Mahatma Gandhi (whose 149th birth anniversary was celebrated this year) had stitched this nation into one, which helped us all these years. Today, we often stand divided. You have to work to end this strife. The nation is just coming out of the situation of shortages and poverty. It will need the 1.3 billion people of this country work together to move forward to tackle challenges.

9. So has your institute prepared you for all these challenges? If you have learnt to learn, then you are indeed ready. Your knowledge and skills gained here will of-course be there always for you. But of all things, it is interdisciplinary work that will enable you to tackle difficult challenges. It is at that time, the knowledge gained by not just you, but by your classmates from different disciplines can become very useful. There is always going to be a bond amongst the batchmates, even if you do not know all of them today. You have to just nurture it. I hope the graduating class today quickly form an email-group and may be a Whats App group. Staying in touch with each other, discussing and debating all kinds of things with each other, learning from others, seeking help from them -- all these will get you going and will stay with you. Just do it.

10. Finally there may be some subjects and concepts that you have found boring in the class. You may not have mastered some of these. But over the years, you may suddenly find that even this limited familiarity may be of immense use. There will be many occasions in the future that you will find all that you have learnt here, in the class and outside the class (and I need to give sufficient emphasis to outside the class) very useful. Thank your institute for what it has given to you. Come back to the institute often. Come back in five years, in ten years, and every five years ever-after. Contribute to IIT Mandi. Some of you should become faculty here. Contribute to make this institute the finest in the world. You owe this to IIT Mandi. Thank your class for becoming an extended family for you. There will be many-many challenges as you walk into the future. As I said, do not just watch these changes happen. Drive them. You will personally be successful and nation will benefit immensely. IIT Mandi will be proud to see its alumni drive such changes.

I want to again thank IIT Mandi for inviting me to this great occasion. And I again congratulate each one of you. And I bless you to have a bright future, both personally and professionally.

PROF. ASHOK JHUNJHUNWALA