

INNOVATION HAS TO BECOME A WAY OF LIFE- DR. RAGHUNATH ANANT MASHELKAR



Dr. Raghunath Anant Mashelkar, an eminent scientist, is a Ph.D. in Chemical Engineering. He is the National Research Professor and also the President of Global Research Alliance, a network of publicly funded R&D institute from Asia-Pacific, Europe and USA with over 60,000 scientists. Formerly, Dr. Mashelkar was the Director General of the Council of Scientific and Industrial Research (CSIR) for over eleven years. He was also the President of Indian National Science Academy (INSA).

He is the only third Indian Engineer to have been elected as Fellow of Royal Society (FRS), London in the twentieth century. He is Foreign Associate of National Academy of Science, USA (2005), Foreign Fellow of US National Academy of Engineering (2003), Fellow of Royal Academy of Engineering, U.K. (1996) and Fellow of American Academy of Arts & Science (2011). Thirty universities have honoured him with honorary doctorates, which include Universities of London, Salford, Pretoria, Wisconsin and Delhi.

He has won over 50 awards and medals from several bodies for his outstanding contribution in the field of science and technology. He is the only scientist so far to have won the JRD Tata Corporate Leadership Award

(1998) and the Star of Asia Award (2005) at the hands of George Bush Sr., the former President of USA.

The President of India honored Dr. Mashelkar with Padmashri (1991) and with Padmabhushan (2000), which are two of the highest civilian honors in recognition of his contribution to nation building. He is a Director of Tata Motors Limited, Hindustan Unilever Limited, Thermax Limited, KPIT Cummins Infosystems Limited, IKP Knowledge Park, Piramal Enterprises Limited (formerly Piramal Healthcare Limited) and several private limited companies. He is also a Director of Reliance Gene Medix Plc. (company incorporated outside India).

Dr. R. A. Mashelkar in conversation with Dr. Neetu Ganapathy (Faculty, SDMIMD) and Kopparapu Srivatsa, Sagar Kulkarni, Abhishek Pandurangi, Shreyas R Naik (Students of SDMIMD).

Q: How should the innovations at grass root level be brought into the limelight? Is there a system already in place to showcase our local talent?

A: I am a firm believer that India does not represent just 1.2 billion mouths, but it represents 1.2 billion minds and everyone is capable of inventing! Innovation is successful exploitation of a new idea into practice. There are a lot of inventions that are happening all around. The National Innovation Foundation which was set up in 2000, conducts a biennial national competition for grassroots innovations developed by farmers, mechanics, artisans and others, gives good platform for people to exhibit their skills. Every year outstanding innovations are awarded by the President of India. Many times, we find that 50% of the winners are

illiterates, which is a clear indication that innovation can happen anywhere. Innovation happening in Gujarat might not reach Bihar, so we at National Innovation Foundation help to diffuse the idea so that more people get to know of it. We also try to help them by creating a business model for their innovation, give them initial funding to start their business and we also help them connect to the market. For latest ideas and work being done in this regard please do visit our website www.nif.org.

Q: How will companies treat an entrepreneurial brain in their organization?

A: Every company now is willing to create entrepreneurs within the organization. If you have a bright idea, companies are willing to invest in you. To begin, companies like Intel encouraged entrepreneurs, but now other companies are also doing so.

Q: Can innovation be taught or learnt? If yes, is it possible that innovation be taught in schools?

A: Innovation has to become a way of life. In everything that we do, we have to think how can we do it differently and better. It means right from the time a child grows, it has to be encouraged to be innovative.

First, our school and college curricula should be changed. Now we follow a system where we have only one correct answer for a given question. In life, there is no single correct answer. Except for science of course, like Avogadro number, where you cannot tell that there are two Avogadro numbers! Except for these for everything else there are many answers. I teach a course on innovation at Monash University. In the class I take a glass of water and ask the students the different ways of removing water from the glass. I get

only few answers, but to tell you the fact there are 46 ways through which this can be done.

Second, learning should be through a process of discovery. Learn by doing and not by memorising.

Third, students should be allowed to ask questions. Usually people avoid questions and try to neglect people who frequently ask questions. This should not happen. Innovation can take place only when a continuous questioning is done. Teachers should encourage questions.

Q: Is India with a population of 1.2 billion people ready to accept these changes?

A: In India more than 50% of people are of age less than 25. The beauty about the young is that they do not know that it cannot be done! That means they are innovative.

National Innovation Foundation has mobilised the entries from over 545 districts with the help of the Honey Bee Network, the entries numbering 1,60,000 are on ideas, innovations and traditional knowledge practices. This simple fact that there are 1,60,000 inventions done by artisans, farmers and school dropouts clearly shows that they are ready for change. India is transforming itself. So yes, India is ready to change.

Q: If we consider developed countries and places like Silicon Valley in California, USA, there are so many successful entrepreneurs. Many of them are Indian. Why is it that Indians are not so successful in India?

A: I believe that if Indian genes can express in Silicon Valley, why can they not do so in Indus Valley too? In our Indian systems, risk must be encouraged. Failures must be celebrated. In the USA, failing in your start-up

venture is not an issue. My own son is trying to become an entrepreneur. He had two great ideas but they did not work. Now he is trying out a new idea and I am patiently supporting him till he succeeds. At the NIF, when we find great innovation or a great idea, we don't just give them awards to celebrate their invention but we also help them to set up a business model for their invention. There is no guarantee that a great inventor can be a great entrepreneur. One must keep trying and the ecosystem must be supportive of failure too.

Q: As industries are developing, labourers from agricultural sector are moving towards industries. This has created a shortage of labourers in the agricultural sector. There is a kind of imbalance in these two sectors. How can this be handled?

A: If you consider countries like US, the ratio of farmers to other professionals is very low. Their advantage is that they use large scale farming and it is completely mechanised. Lots of machines are used. Even in India more and more technology must be used. Just as an example consider banking sector. A decade ago, we used to find around 30 people working in a bank in a particular branch. But now things have changed. Now people use internet banking, ATMs. We can do most of our banking transactions through our cell phones now. Number of people now working in banks has reduced drastically. In a similar manner, automation has to happen in the agricultural sector. If you consider a woman working in the paddy fields, she bends continuously for hours together. The pressure she bears is immense. Should we not remove her drudgery by designing, developing and deploying an automatic paddy planting machine?

Industries today are completely different from those we had several years ago. We have moved from

agricultural economy to manufacturing economy to knowledge economy. Technology is impacting everything. Primarily we had a man-machine interaction. Now we have a machine to machine interaction. The next frontier is creative economy. Animation alone is a trillion dollar business today. It's a creative idea that creates change. Creative economy will give opportunity to anybody who has a creative mind.

Q: According to you, is the Social media platform inclusive innovation or not?

A: It is inclusive innovation. It shows how to include more and more people in a process called co-creation. Take the example of CSIR's Open Source Drug Discovery. It is a workflow innovation using crowd sourcing for drug discovery, a true first. In just a couple of years, it has 4500 participants from 135 countries taking part in it. Few decades ago, the pattern was like few geniuses like Faraday or Edison sat and toiled away. Few were successful and few failed. But now it's done in groups. Now it is no more R&D; it is C&D. C&D stands for connect and develop.

If you track the development of communication systems, it all began with telephone which was one to many communications, then came radio which was one to many, then came television, which was one to many, now comes internet and is many to many. Previously in newspapers you had a column where people would comment on the current issues or happening. Now that is no more the case, now just by a click, you get hundreds of views, suggestions etc. People self-organise. They do not require intermediates. From business point of view, whether it is blogs or Facebook, these will help entrepreneurs and innovators a lot. Data driven decision making will become the norm in the future. This is the power of technology.