



WORKSHOP ON

Academia – Industry Collaborations

March 5<sup>th</sup> 2013, New Delhi

Organised by

Ministry of Human Resource Development

Government of India

## The MHRD Consultation for Greater Industry-Academia Collaboration



### Objective

The first consultation to discuss the industry academia collaboration enhancement agenda was held on March 5<sup>th</sup> 2013 in New Delhi, India. This consultation was held between the Ministry of Human Resource Development and the leading representatives of industry as well as Indian academics from across various states of India. It was presided over by Dr. MM Pallam Raju, the Honourable Union Minister for Human Resource Development. Key participants included Mr. Jitin Prasada and Dr. Shashi Tharoor, Ministers of State for Human Resource Development, Mr. Ashok Thakur, Secretary (Higher Education), Mr. S Ramadorai, Advisor to the Prime Minister on Skills Development among many eminent leaders of the industry, chairmen of higher educational institutions, directors of higher educational institutions, leaders in academia as well as other officers from the Ministry of Human Resource Development.



This consultation was attended by a select number of key influences in the Indian technical academic and industrial sectors with the objective of addressing the key issues and challenges that hinder the advancement of collaboration between industry and academic institutions in India.

In India, a number of initiatives for industry-academia linkages have over years yielded positive results in research, but as these remain sporadic in nature India's share in world researchers has persisted at about 2 percent as compared to 20 percent of the USA and China's. The share of research and development (R&D) investments of the USA was 32 percent, of Japan 13 percent and China 9 percent, it was only 2.2 percent in India<sup>1</sup>. Significantly, an analysis of the share in R&D shows that in India, the government share is between 75-80 percent, the private sector's share is 20-25 percent, and that of universities is 3 percent, while in OECD countries, the government share is 10 percent, the share of the private sector is 69 percent, the share of universities is 18 percent and of the non-profit organisations is 3 percent. As a share of GDP also, India's R&D spend is about 1 percent as against a target of at least four per cent if double digit GDP growth is to be achieved. Currently, global investment in R&D is \$1.2 trillion and significant share originates from the private sector through their collaborative research with academia. China has 300 research parks; and MIT has over 700 companies working with its faculty on projects of mutual interest.

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<sup>1</sup> Source: UNESCO Institute of Statistics

There emerges an urgent need for the government, industry and academia to jointly taking concrete actions. A number of committees have made several recommendations on this issue, significant among which were the National Knowledge Commission in 2008<sup>2</sup>, the Kakodkar Committee Report<sup>3</sup> in 2011 on the Indian Institutes of Technology (IITs) and the Narayan Murthy Report<sup>4</sup> in 2012. All these reports emphasize the significance of enhancing academia-industry collaboration for augmenting research, innovation, employability and greater productivity, through various measures.

At the outset of the discussion, H'ble Minister Dr. Pallam Raju pointed out that the current stage of industry-academia linkages in India today is still quite nascent. He further pointed out that a more sustaining and long term structural plan for continuous development would serve to be mutually beneficial for the industrial sector as well as the academic research driven sector of India. Further, Dr. Pallam Raju pointed out the following challenges that face the technology industry and academia today.



- ❖ Even though India prides itself on significantly enhancing the service sector, the capacity and competency of the manufacturing sector in India requires serious attention
- ❖ Despite excellent work being carried out in academic research labs, there is a considerable lag in converting into a marketable commodity
- ❖ There are weak linkages between the research and development taking place in academic laboratories and the various manufacturing companies that could use that research to advance

The main purpose of this meeting was to identify how to sustain the industry academia interaction, and to understand how to scale this interaction further. The objective of the consultation meeting was therefore to discuss the predominant challenges that are facing collaboration of industry and academia and to structure a clear road map for the involvement of every relevant stakeholder and for the mutual benefit of not only industry and academia but also for India as a nation.

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<sup>2</sup> National Knowledge Commission is a high-level advisory body to the Prime Minister of India, with the objective of transforming India into a knowledge society

<sup>3</sup> Kakodkar Committee Appointed by MHRD to Recommend Autonomy Measures to Facilitate IITs Scaling Greater Heights

<sup>4</sup> The Narayan Murthy Committee on Corporate Participation in Higher Education

## Synopsis

The key discussion points that emerged from the consultation included the following.

- ❖ Academia and industry need to recognize each other's strengths and strive towards greater trust and communication
- ❖ India needs structural changes so that business enterprises are able to spend government funding on research and development
- ❖ Collaboration must be taken beyond fundamental research. The issues of confidentiality of projects and intellectual property rights (IPR) must be addressed
- ❖ Success stories of industry-academia collaboration across the nation must be documented
- ❖ Key thematic areas for collaboration include the manufacturing industry, defence production, energy, health, water and the social sector keeping in mind the larger development challenges in the country.
- ❖ Development of skills should also be brought to the forefront in addition to focus on higher technical education



Key participants and eminent leaders from the industry and academia in India included the following

- ❖ Dr. Shashi Tharoor, Minister of State for Human Resource Development, Government of India
- ❖ Mr. Jitin Prasada, Minister of State for Human Resource Development, Government of India
- ❖ Mr. Ashok Thakur, Secretary (Higher Education), Ministry of Human Resource Development, Government of India
- ❖ Ms. Amita Sharma, Additional Secretary, Technical Education & Technology Enabled Learning, Ministry of Human Resource Development, Government of India
- ❖ Mr. Anant Kumar Singh, Joint Secretary, Ministry of Human Resource Development, Government of India
- ❖ Dr. Ramadorai, Adviser to Prime Minister, National Skills Mission
- ❖ Mr. T Ramaswami, Secretary, Department of Science and Technology, Government of India
- ❖ Mr. Dilip Chenoy, CEO, National Skills Development Corporation
- ❖ Dr. Anil Kakodkar, Chairman, Board of Governors, IIT Bombay
- ❖ Mr. Hari Bhartia, Co-Chairman and Managing Director, Jubilant Life Sciences
- ❖ Prof. Shevgaonkar, Director, IIT Delhi

- ❖ Mr. Ravi Kant, Vice Chairman, Tata Motors
- ❖ Prof. Vinod Singh, IISER, Bhopal
- ❖ Prof. Gopinath Pradhan, Vice Chancellor, Indira Gandhi National Open University (IGNOU)
- ❖ Mr. Dhruv Sawhney, Director, Triveni Group
- ❖ Mr. KV Kamath, Chairman, ICICI Bank and Infosys
- ❖ Mr. RC Bhargava, Chairman, Maruti Suzuki
- ❖ Prof. Shailendra Mehta, Professor, IIM Ahmedabad
- ❖ Prof. Ajit Balakrishnan, Chairman, IIM Kolkata
- ❖ Prof. Prem Kalra, Director, IIT Jodhpur
- ❖ Mr. Vinay Rai, Chairman, Education Committee, ASSOCHAM
- ❖ Dr. Rajiv Sangal, Director, IIIT Hyderabad
- ❖ Dr. S S Mantha, Chairman, All India Council for Technical Education (AICTE)
- ❖ Prof. Swapan Bhattacharya, Director, NIT Suratkal
- ❖ Ms. Shobha Mishra, Senior Director, FICCI
- ❖ Prof. Falguni Raj Kumar, Chairman, IIM Shillong
- ❖ Prof. Indranil Manna, Director, IIT Kanpur
- ❖ Dr. Abhijit Mukherjee, Dean, R&D, IIT Gandhinagar
- ❖ Dr. Anurag Kumar, IISc Bangalore
- ❖ Mr. Dhiraj Mathur, Lead, Education Practice, PwC
- ❖ Mr. Khozem Merchant, Head, Pearson India
- ❖ Dr. Shabnam Singh, Max Healthcare
- ❖ Dr. Khan Masood Khan, Dean, Jamia Milia Islamia
- ❖ Mr. AC Muthiah, Director, Southern Petrochemicals Industries Limited (SPIC)



## Outcomes

The consultation resulted in several concrete steps are elaborated below

- ❖ Key areas related to research & innovation, entrepreneurship, skill building & employability as well as institutional mechanisms were identified for future discussion. These were as follows:

### (a) Research & Innovation

- Linking research with products
- Cross visits between private and public institutes
- Curricular reform: seek active involvement and support of industry in shaping academic programs
- Need for more PhD students
- Can industry adopt students from day one on campus?
- Visiting faculty from industry; international faculty
- Institute-to-institute collaboration especially with reputed international institutes



- Run academic programs for industry through distance mode MTech, PhD
- Faculty Performance Evaluation is a critical requirement
- Sabbaticals for faculty for Industry-related research
- Investment with definite focus and returns
- Encourage high risk-high reward Research
- Invest in new tools for research; can IITs take up research for cost-effective technologies
- Enhance research funding at early stage from government – incentivize private sector for translational research
- PPP in research; problem identification by government; force competition between public and private institutions for solutions (Various models for this: Canada, US, Germany)
- Implementation of right research processes will assist in achieving better results in addition to better monetary return
- Product Development Cells in institutions
- Use public sector facilities for research and training
- Defense research becomes driver of all other research too
- Frequent dialogue between academia and industry through seminars and workshops
- Industry to help institutes market their capabilities
- Best talent isn't going into research; seduce it with higher research grants and higher research component at undergrad and PhD fellowship levels
- Higher tolerance levels for failure in high end cutting edge research
- Attitudinal change in mindset for funding high-risk ventures
- Institutes have to cultivate a fundamental behavioural change in students that will lead to a life-long attitude towards problem identification and solving



#### (b) Entrepreneurship

- Grants to IIT students of INR 10-20 lakh to catalyze start-ups/productivisation
- Ecosystem for even faculty to set up start-ups and commercialize their own research

#### (c) Skill Building and Employability

- To enhance employability, summer internships should be made an integral part of the curriculum
- Partnership between industry and academia for industry ready/right-skilled human resource
- Go vocational industry-wise; take it all the way to schools and colleges in districts
- Industry participation in curriculum preparation
- Specialist courses would be great job creators. This has to be sector specific; Soft Infrastructure
- Codify all learning – skill building is the most important requirement
- Ask academia to develop curriculum so that corporate sectors' training requirement are reduced
- National Vocational Education Qualification Framework (NVEQF) and mainstreaming skills into education

- Community colleges and polytechnics in the public-private partnership model (PPP)
- Bachelors programme in vocational education
- Skill knowledge providers
- Sector-specific initiatives
- Make manufacturing sector attractive to students of IIMs and IITs
- Sandwich courses – postgraduate (PG) programs for industry executives
- Joint academia-industry guide for research
- Faculty development through corporate participation
- Mechanisms for monetising and scaling research and formal knowledge transfer
- Sponsored research sabbaticals by corporations for employees in Centres of Excellence (CoEs)
- Internships/apprenticeships offered by corporations
- Business/industry mentors for students (especially institute alumni)
- Faculty development support by industry through chairs and sabbaticals
- Teaching retired corporation employees
- Collaboration between Medium, Small & Micro Enterprises (MSMEs) and All India Council for Technical Education (AICTE) institutes; Product Development Cells in some

(d) Institutional Mechanisms

- Risk Money is essential for funding research. Need to build USA style venture funding environment; tax breaks
- Innovation Clusters
- UK Model – Grants from the government for relevant are channelized through universities
- Israel Model – Innovation rich, multi-disciplinary approach, break silos in academia institution, can't just be pure research – leads to application focus
- MITACS Canada
- Create SPVs to connect institutions with industry
- Strengthen databases
- National initiative for technology transfer including setting up of research parks
- Establishment of Council for Industry and Higher Education Collaboration

❖ Immediately after the consultation on March 5<sup>th</sup> in New Delhi, three national task forces were created to recommend action points based on the March consultations. The following three focus areas were brought out to scale up or leverage existing models and to roll out newer models.

- (a) Research, Innovation and Entrepreneurship (focusing on Manufacturing, Defence & Sustainable Development and key national goals such as Social Development, Health and Water)
- (b) Skills and Employability (focusing on Manufacturing & Services)
- (c) Institutional Mechanisms (for collaboration between Industry and Academia)



Each task force was comprised of eminent and expert industrialists and academics as well as government representatives. Their reports were presented and discussed in an international workshop involving a larger cross section of stakeholders on April 15<sup>th</sup>, 2013.