

**GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
LOK SABHA
STARRED QUESTION No.365
TO BE ANSWERED ON 13/12/2019**

LINKAGE BETWEEN EDUCATIONAL INSTITUTES AND INDUSTRY

***365. SHRIMATI RITA BAHUGUNA JOSHI:**

Will the Minister of SCIENCE AND TECHNOLOGY विज्ञान और प्रौद्योगिकी मंत्री be pleased to state:

- (a) whether the Government has taken steps for improving the linkage between educational institutes and industry to promote research and development that meets the demands of the market;
- (b) if so, the details thereof;
- (c) the steps taken by the Government for promoting the contribution of women scientists in the field of Science and Technology;
- (d) the achievements of the Government with respect to the “Scheme for Young Scientists and Technologists” in addressing the problems of the society; and
- (e) the achievements of the Government under the scheme ‘Innovation in Science Pursuit for Inspired Research Programme (INSPIRE)’?

ANSWER

**MINISTER OF HEALTH AND FAMILY WELFARE; MINISTER OF SCIENCE AND TECHNOLOGY; AND MINISTER OF EARTH SCIENCES
(DR. HARSH VARDHAN)**

**स्वास्थ्य और परिवार कल्याण मंत्री; विज्ञान और प्रौद्योगिकी मंत्री; और पृथ्वी विज्ञान मंत्री
डॉ. हर्ष वर्धन**

(a) to (e): A statement is laid on the Table of the House.

STATEMENT AS REFERRED IN REPLY TO PARTS (a) TO (e) OF LOK SABHA STARRED QUESTION NO.365 FOR 13/12/2019 REGARDING LINKAGE BETWEEN EDUCATIONAL INSTITUTES AND INDUSTRY ASKED BY SHRIMATI RITA BAHUGUNA JOSHI

(a) & (b): Government has taken several significant steps for improving the linkage between educational institutes and industry to promote research and development (R&D) that meets the demands of the market. The Government has adopted three-pronged strategy to link educational institutes and industry. First strategy has been building platforms to bring both academics and industry together on industry relevant (R&D) projects. Secondly, opportunities have been created for building industry trained human resource to connect research with society. Thirdly, to institute favourable policy frameworks to initiate Start-Ups and industries to advantageously connect research outcome from laboratories to the market.

The Department of Science & Technology (DST) is implementing a National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) to create a strong foundation and a seamless ecosystem for CPS technologies by coordinating and integrating nationwide efforts encompassing knowledge generation, human resource development, research, technology and product development, innovation and commercialization. Innovation Hubs envisaged under NM-ICPS connect educational institutes, industry, Central Ministries and State governments in developing solutions to meet the demands of the market. The Ministry of Human Resource Development (MHRD) in partnership with DST and Science and Engineering Research Board (SERB) is implementing a scheme “IMPacting Research INnovation and Technology (IMPRINT)” to address major engineering challenges relevant to India through an inclusive and sustainable mode of translational research steered by the top engineering institutions in the country. The Uchhatar Avishkar Yojana (UAY) is another partnership programme between MHRD and several other ministries including DST/SERB with a view to link educational institutes and industry and promote innovation that directly impacts the need of the industries.

National Initiative for Developing and Harnessing Innovations (NIDHI), an umbrella programme of DST, was launched with an aim to nurture Start-Ups through scouting, supporting and scaling of innovations. Several initiatives including establishing Technology Business Incubators have been undertaken under NIDHI, which operates through key stakeholders namely, central government ministries and departments, state governments, academic and R & D institutions, mentors, financial institutions, angel investors, venture capitalists and private sectors.

Industry Relevant R&D (IRRD) scheme of SERB was launched with the objective to utilize the expertise available in academic institutions and national laboratories to solve industry specific problems for the larger benefit of society. IRRD supports joint proposals by academic and industry partner. SERB-TETRA (Technology Translation Award) is a new scheme for catalyzing technology translation in academic setting. With a seed capital, flexible working spaces and interaction between mentor and startup entrepreneurs, the SERB-TETRA would expand the scope by providing numerous networking opportunities with an aim to connect the outcome of R&D projects to an audience of investors, Micro, Small & Medium Enterprises (MSMEs) and private companies for reaching out to the market. The Prime Minister’s Fellowship for Doctoral Research of SERB is aimed to promote industry-relevant research at Ph.D. level. The scholars are provided with double scholarship, 50% of which is provided by government (SERB) and balance 50% by a sponsoring industry for a period of four years.

SATHI-Sophisticated Analytical & Technical Help Institute is a recently launched scheme of DST to strengthen and develop infrastructure for science and technology in universities and other institutes of higher education. SATHI has been designed to provide high-end analytical testing and prototyping services to industry, MSMEs, start-ups and academia.

Several joint programmes with industry such as DST-Intel on river water and air quality monitoring, DST-Thermax Limited, Pune on methanol production from Indian coal were launched to promote the academia industry linkages. Under the DST-Intel collaborative research programme, four consortia have been supported that aimed to develop tools and constituent blocks that will enable end to end water and air quality monitoring systems on smart, networked, low cost, low power sensor nodes with large scale cloud based data analysis.

Several institutional platforms such as Technology Development Board (TDB), Technology Information, Forecasting and Assessment Council (TIFAC), Global Innovation and Technology Alliance (GITA) and Biotechnology Industry Research Assistance Council (BIRAC) facilitate technology translation at various levels in close coordination with educational institutions and industry.

Council of Scientific and Industrial Research (CSIR) has dynamic network of 38 constituent laboratories pursuing R&D activities in key areas which are important to industry and provides significant technological interventions with industry in many areas with regard to societal efforts. CSIR entered into Memorandum of Understanding (MoU) with educational institutions and Indian industrial firms to focus on developing joint technology development projects & technology transfer and also empaneled external agencies for promoting and marketing CSIR knowledgebase.

(c) The Ministry of Science and Technology has several women centric programmes for promoting the contribution of women scientists in the field of Science and Technology. DST has started a scheme 'Knowledge Involvement Research Advancement through Nurturing (KIRAN)' in 2014-15 to ensure participation of women in the field of Science and Technology (S&T) through gender enabling programmes. One of the programmes, 'Women Scientist Scheme' provides career opportunities to unemployed women scientists and technologists, especially those who had a break in career. There are three major components of Women Scientists Scheme namely, i) Women Scientists Scheme-A (WOS-A) for conducting research in Basic & Applied Sciences, ii) Women Scientists Scheme-B (WOS-B) for research projects that entail S&T interventions for Societal Benefit and iii) Women Scientists Scheme-C (WOS-C) that enables them to become Intellectual Property Rights (IPR) professional. In 2016-17, 'mobility' component has been introduced under KIRAN to address relocation issue of working Women Scientists. In 2017-18, DST launched a programme 'Indo-US Fellowship for Women in STEMM' (Science, Technology, Engineering, Mathematics & Medicine) to provide opportunities to Indian Women Scientists, Engineers & Technologists to undertake International collaborative research in premier institutions in USA for duration of 3-6 months. Further, Women Scientists & Technologists are also encouraged to avail capacity building programmes related with R&D, entrepreneurship, managerial skills and leadership under 'National Program for Training of Women Scientists & Technologists working in Government Sector' of DST. Under KIRAN, institutional support is also provided through 'Consolidation of University Research through Innovation and Excellence in Women Universities (CURIE)' Programme. SERB Women Excellence Award is a one-time award given to women scientists below 40 years of age who have received recognition from any one of the national academies such as Young Scientist Medal, Young Associate etc. DBT is also implementing 'Biotechnology Career Advancement and Re-orientation Programme (BioCARE)' to enhance the participation of Women Scientists in Biotechnology research. National Women Bioscientist Award is an initiative of DBT to recognize outstanding research contributions of women scientists in basic and applied research areas of Biosciences and Biotechnology. During 2019-20, DST with an aim to increase the number of women in STEM education has started a new scheme "Vigyan Jyoti" for girl students of Class 9 to 12.

(d) The Ministry encourages and empower Young Scientists through several enabling mechanisms like fellowships, start-up grant, mobility grant, awards etc. The Scheme for Young Scientists and Technologists (SYST) of DST is one of the schemes to encourage scientists and technologists to take up societal challenges and provide S&T driven solutions to it. A total of 152 projects have been awarded to potential young scientists to address various facets of societal issues.

Some of the noteworthy achievements under SYST include: Dyes, fixtures and manually operated equipment for manufacturing bamboo stripes, were developed for bamboo artisans. Developed equipments were transferred to Tool Room and Training Centre (TRTC), Guhawati, Ministry of Micro Small and Medium Enterprise for training 2000 artisans/year.

Region specific, economically effective, Integrated Pest Management (IPM) package was developed for the management of red spider for the benefit of tea farmers. Two workshops were organized in Assam and Tripura and were attended by 324 farmers.

An eco-friendly package of practice for cultivation of Phalaenopsis orchid has been standardized for cultivation in tropical hill. This crop due to low volume and high value has great potential to double the farmer's income. Training was imparted to 950 farmers and 20 children with special ability.

Eco-friendly biopesticide for Poplar defoliator called 'Rakshak' was developed demonstrating 70% efficacy. Training was imparted to 150 farmers from Uttarakhand, Uttar Pradesh and Haryana.

One of the in vivo and in vitro studies validated that Sex Selection Drugs (SSDs) contains heavy metals and phytoestrogens that affect the reproductive capacity and tissue formation of fetus. A communication package on an important social aspect of adverse effects of SSDs on growing fetus was developed and disseminated at 7 railway stations in North India.

(e) Innovation in Science Pursuit for Inspired Research (INSPIRE) Programme was conceptualized, designed, developed and implemented by DST to identify, sustain and strengthen human capacity for R&D base of the country. There are various components of the scheme addressing different levels from school to postdoctoral level. Some of the achievements under various components of the Programme are given below:

INSPIRE Awards MANAK (Million Minds Augmenting National Aspiration and Knowledge) scheme, starting from 2017-18 is a unique initiative for attracting school students at an early age to study science and pursue research career apart from promoting research and fostering a culture of innovation among them. The scheme invites innovative, creative and useful ideas from school children in the age group of 10-15 years which are submitted on-line in 22 different languages. Out of these, up-to one lakh ideas are eligible for INSPIRE Award of Rs. 10,000/-each, part of which is used for building prototype / models. With these models / projects, the selected students participate in District, State and National Level Exhibitions. The participants of National Level Exhibition are provided mentorship at premier educational and technical institutions of the country. Top sixty projects are rewarded as National Winners. A total of 1,23,094 INSPIRE Awards have been sanctioned in the last three financial years.

INSPIRE Internship arranges Science Camps for about 50,000 youths per annum to provide opportunities for Class XI science students who are within top 1% of Class X board examinations to interact with leading researchers and scientists including Nobel Laureates for experiencing the joy of innovations. So far about 4 lakh students in the age group of 16-17 years across the country have availed of this opportunity.

Scholarship for Higher Education (SHE) aims to empower performing students to undertake higher education in science intensive programmes by providing scholarships and mentoring. The scheme offers 12,000 scholarships every year @ Rs 0.80 lakh per year for undertaking Bachelor and Masters level education in natural and basic sciences for performing students in the age group 17-22 years. So far 89,276 students have availed SHE Scholarship.

INSPIRE Fellowship (age group of 22-27 years) offers 1000 INSPIRE Fellowships every year, for carrying out doctoral degree in both basic and applied sciences including engineering, agriculture, veterinary and medicine. So far about 8500 students have been offered INSPIRE fellowships to pursue Ph.D. in S & T.

INSPIRE Faculty Fellowship Scheme offers opportunity every year for up-to 100 postdoctoral scientists in the age group of 27-32 years in both basic and applied sciences including engineering, agriculture, veterinary and medicine for carrying out 5 years of quality research at any recognized university/ academic institutions/ laboratory in the country. The scheme prepares a pool of quality scientists for potential employment in R&D and academic sector. So far 1,244 Young researchers have been offered faculty fellowship to pursue a career in R&D.
