

Department of Zoology,
Seth GB Podar College, Nawalgarh,
Jhunjhunu 333 042, India
e-mail: daulalbohara@yahoo.com

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NEWS

‘Accelerate Vigyan’ – Aggregating skill development in S&T

There are several existing capacity building programmes supported by various scientific departments as well as premier institutions/labs/organizations in the country, which facilitate students aspiring or engaged in R&D through regularly held thousands of nationwide seminars, symposia, workshops and other such training events. However, there is no collective and coordinated platform to aggregate these efforts in order to avoid duplication and consequent redundancies. The Science and Engineering Research Board (SERB) itself, through its existing ‘Seminar/Symposia’ programme facilitates hundreds of such events by providing partial grant-in-aid to organize them. Such funding support and conference organization are also true for other departments and ministries. However, the efforts toward capacity building, training programmes, and skill development by various ministries/departments often remain unnoticed by the intended beneficiaries for the want of an aggregating data base and a well-populated web portal.

The ‘Accelerate Vigyan (AV)’ is a SERB scheme conceptualized to bridge this gap. This scheme was conceived upon the broad recommendations of the Group of Secretaries (SGO-8), to provide a big push toward high-end scientific skill and knowledge development by preparing capable skilled scientific manpower which can contribute to the growing R&D ecosystem of India, get relevant training in niche S&T domains, in order to contribute and participate in knowledge-based Indian economy. This inter-ministerial initiative of the Government of India would turn out to be an effective complementary enabler for the ‘Skill India’ mission launched five years ago and is managed by the National Skill Development Corporation.

Recognizing that modern research stands on the foundations of state-of-the-

art knowledge, and well-trained and skilled researchers, AV intends to initiate and strengthen mechanisms of mentoring, training, skill enhancement, and hands-on workshops, on the national scale. The overarching aim will be to transfer desired skill sets, useful knowledge, and creation of trained S&T manpower, with three broad goals – consolidation/aggregation of all scientific training programmes, high-end workshops and creating opportunities for development of research skills. The AV scheme was launched online on 1 July 2020, marking the announcement of first call for its various programmes through multi-modes like press release, pan India newspapers, social media platforms, web portals of S&T departments, mass autogenerated emailers, etc. The first call cycle shall be concluded by 31 August 2020 (refer Accelerate Vigyan website <http://www.acceleratevigyan.gov.in/> for more information).

The scheme Accelerate Vigyan has two main components – ‘Skill Development’ and ‘Bring Together’, being referred in Hindi language as अभ्यास (Abhyaas) and समूहन (Samoohan). These components have been further sub-divided into two programmes each (Figure 1).

The ‘Abhyaas’ component will strive to boost research and technical skill development in the country by enabling and grooming potential students by augmenting their skills in high-end thrust areas across S&T disciplines. It is further sub-divided into two programmes: High-End Workshops (‘Karyashala’) and Technical Internships (‘Vritika’). These two programmes are especially vital for those who have limited opportunities to access such learning capacities/facilities/infrastructure in their own centre of learning. ‘Karyashala’ is aimed mainly to give support for hands-on experience in learning operations and handling of high-end scientific instruments and other pre-identified theme-based skills essential to become a contributing member of the R&D ecosystem. ‘Vritika’ is the call for practice in science through flexible duration research skill development internships. This capacity building is expected to be executed at premier institutions with the help of mentors who are willing to train students in niche tools and techniques.

As part of this acceleration drive, we envisage to organize/aggregate ~1000 high-end workshops to provide opportunities for ~25,000 postgraduate and

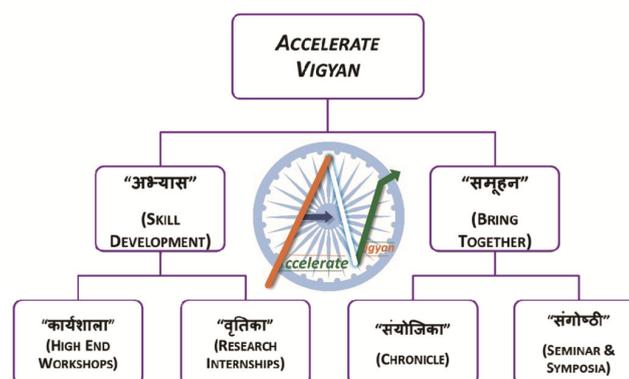


Figure 1. Components of Accelerate Vigyan.

doctoral students in the next five years, in collaboration with mentors in premier scientific institutions and laboratories. Also, central coordination of skill development internships will provide opportunity to ~5000 potential postgraduate students during next five year duration. The current call for applications invites event organizers for the winter season (December 2020–January 2021).

Another component, ‘Samoohan’, aims to aggregate and consolidate all scientific interactions in the country on a common platform. ‘Samoohan’ has been sub-divided into two programmes: ‘Sayonjika’ and ‘Sangoshti’. Sayonjika is an integrated, open-ended programme to catalogue all capacity building activities in S&T in India supported by various government funding agencies. This programme is being implemented through an Inter-Ministerial Overseeing Committee (IMOC) involving all scientific departments/ministries and few other significant entities such as UGC. Whereas Sayonjika aims to encourage skill conference/workshop organizers to register with the Accelerate Vigyan online portal, utilize its logo and submit completion report as well as outcomes, Sangoshti is a minor rebranding of SERB’s pre-existing programme ‘Seminar and Symposia’, as brought out earlier.

The repository of skilled manpower developed across different disciplines and the final outcomes captured in the process, through all the sub-components of the Accelerate Vigyan, will be available to all stakeholders (students, teachers, researchers, science administrators and policy makers) and help in planning, conducting and participating in capacity building activities in the country.

A bigger challenge is to ensure that interested students are offered the possibility of acquiring real skill development with seamless involvement as well as personal commitment of expert faculty/scientists and support from their institutions. Thus it is important that the skill/technical workshop organizers (mentors) have a high level of commitment not only as scientists, but also present themselves as defining role models. At the same time, it is also important not to set over-didactic standards. It is expected that faculties/scientists who serve as their mentors would get involved and invest their valuable time as a part of scientific social responsibility. The latter is an important and much needed paradigm to diffuse science and technology in the country.

The capacity development of such nature, specifically on the skills acquired at high-end equipment will create a pool of

the enthusiastic researchers who will not only contribute in research ecosystem, but can also aspire to join Start-up India, Make-in-India initiatives to exponentially expand expert base and creation of knowledge-driven economy. This is important as we commit our time and resources for a better future.

Toward this end, Accelerate Vigyan through its planned current and future outreach and awareness activities also endeavour to reach out to the entire length and breadth of this country, and bring the benefits of this scheme to relevant stakeholders in real-time. Future will also see the launch of SERB-Accelerate Vigyan mobile app, management information system, gamification modules, and much more to make this scheme vibrant, user-friendly and easily accessible.

Accelerate Vigyan is expected to be a game changer for developing R&D career paths and developing skilled S&T manpower for the nation.

Rajeev Kumar Mehajan* and **Sandeep Verma**, Science and Engineering Research Board, Department of Science and Technology, New Delhi 110 070, India.
*e-mail: mehajan.rk@nic.in

MEETING REPORT

Prospective applications of artificial intelligence/machine learning techniques in earth sciences*

Over the last decade, rapid developments in artificial intelligence (AI) and machine learning (ML) framework have reached a point where these techniques can be used for solving complex problems and to bring new insights to predictive capabilities. Now it is an opportune time to utilize these concepts in earth sciences problems such as weather/climate forecast, climate change, geophysics and other domains. The Ministry of Earth Sciences (MoES), Government of India (GoI) is keen to apply these

technologies in improving the weather forecast generated from numerical models.

For kicking-off such activities at MoES, a three-day meeting on the application of AI/ML to earth sciences problems was conducted. The main aim of the meeting was to gather researchers working on AI/ML and scientists from different areas of earth sciences to exchange knowledge, and develop innovative ideas and strategies to demonstrate a wide range of open problems utilizing the potential of AI/ML. Thirty-four delegates from research organizations, industry and academic institutions participated in this meeting. The meeting was inaugurated by the Secretary, MoES, who highlighted

the explosive growth of data availability in the field of earth sciences. He emphasized the need of extracting scientific information from these data, and mentioned that computational resources required for such data analysis are now available and AI/ML can offer efficient techniques to retrieve useful information. However, one needs to identify specific areas where these techniques could be used and also the persons/groups who can develop AI/ML tool to address such problems.

The delegates shared their opinions about prospective work that could be pursued on topics related to earth sciences. Few of these are mentioned below.

*A report Meeting on the Application of AI/ML to Earth Sciences held at Indian Institute of Tropical Meteorology, Pune during 25–27 March 2019.