OVERHAULING RESEARCH IN INDIAN UNIVERSITIES

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In the era of global competition for world rankings, accreditation and ever-growing influence of technology, the higher education sector is increasingly becoming important in India's growth strategy. Researches would help industries in the context of Industry 4.0 to perform better without polluting the environment, and the government policy should be to encourage close liaison between institutions and industries. The inter-university research collaborations advocated in the New Education Policy 2020 (NEP 2020) will help the universities to improve the standard of research and teaching in various fields. Government funding for research projects in India is about 70 per cent and the corporate sector spends only about 30 per cent, but in developed countries, most of the research and development projects are mainly funded by the corporate sector and the government spends only a meagre percentage. The future vision of industrial revolution 4.0 urgently requires young men and women with innovative thinking for inventing new things for the future industrial world and, in this respect too, overhauling research is required in the Indian universities.

PRELUDE

It is an undeniable fact that the Indian universities are giving added impetus to research and innovation for developing and taking the nation in all its fields to the next level. Researchers are encouraged to discover and invent new technologies in every sphere, and getting funds is not a problem today for serious researchers. Ministry of Human Resource Development (MHRD) has allocated enormous funds for research projects and is helping universities to enhance and improve quality in the areas of teaching and research that would ultimately benefit the society at large.

In the recent years, towards achieving this goal, the University Grants Commission (UGC) has initiated a number of new schemes like SWAYAM (Digital Learning), Smart and Swachh Campus, Smart India Hackathon (Startup), National Apprenticeship Promotion Scheme

(NAPS), Unnat Bharat Abhiyaan (Socio-Economic Betterment of the Community) and Learning Outcome Based Curriculum Framework (LOCF), etc. Smart and Swachh campus programmes have been implemented in all universities to equip them with smart and digital classrooms i.e., to offer digital learning in an aesthetically appealing green and clean environment. Every campus is evaluated and ranked by the MHRD for its quality and standard of maintaining cleanliness and hygiene. Digital learning is encouraged through SWAYAM, which offers free online courses to students with a view to making them employable in the job market on completion of their courses of study.

MHRD INITIATIVES TOWARDS RESEARCH

In the era of global competition for world rankings, accreditation and ever-growing influence of technology, the higher education sector is increasingly becoming important in India's growth strategy. Some of the other significant initiatives of MHRD have to be noted here:

- The IMPRESS Scheme (Impactful Policy Research in Social Sciences) aims to identify and fund research proposals in Social Sciences with an impact on the governance and society.
- The SERB-STAR Scheme (Science and Engineering Research Board's Science and Technology Award) has been supporting basic research in frontier areas of Science and Engineering.
- The STRIDE (Scheme for Trans Disciplinary Research for India's Developing Economy) aims to build multi-sectoral linkages between university, government, community and industry for national development.
- The SPARC (Scheme for Promotion of Academic Research Collaboration) has the objective of promoting joint research projects between Indian institutions and the best of the global universities from 25 selected countries. It provides funds for visits and long term stay of international faculty and researchers in Indian institutions, and also gives funds for training Indian students in premier international laboratories.
- LEAP (Leadership for Academicians Excellence Programme) aims to equip senior faculty members to take up leadership roles in future at various levels in higher educational institutions.

RESEARCH AND INDUSTRY 4.0

Researches, in fact, should help industries in the context of Industry 4.0 to perform better without polluting the environment, and the

government policy is to encourage a close liaison between institutions and industries. This linkage is expected to boost the production so as to develop and sustain the economy. The inter-university research collaborations advocated in the New Education Policy 2020 (NEP 2020) will help universities to improve the standard of research and teaching in various fields. The introduction of inter-disciplinary courses would provide combinations of various disciplines for helping students develop a holistic approach. The research collaborations will meet out the industry expectations; the holistic approach of learning will make the students well versed in all fields.

It is relevant and important to note here that the government funding for research projects in India is about 70 per cent according to available information and the corporate sector spends only about 30 per cent, but in the developed countries most of the research and development projects are mainly funded by the corporate sector and the government spends only a meagre percentage. This is the real situation globally. Hence, the Indian government's role in promoting research and innovation needs to be appreciated. The MHRD has drafted a number of policies and initiated many programmes to make the Indian universities places for relevant research and innovativeness, and the policies also aim at achieving excellence in extension activities that would benefit the society. The Smart India Hackathon Scheme has helped a number of students to become entrepreneurs and they have started their own startups, which would provide more employment to the next generation. Skill India is yet another scheme of the government that endeavours to make the student community a highly skilled work force ready for employment. The industry expects highly skilled manpower from universities. The National Apprenticeship Promotion Scheme (NAPS) is one of the schemes implemented by the state to promote apprenticeship training in industries. On-the-job training/practical training is encouraged through this scheme to fulfill the expectations of new industries.

In the World Economic Forum meeting held in January 2016, Davos-Klosters, Switzerland, highlighted the importance of Fourth Industrial Revolution for the future world. Industry 4.0 is the new industry trend that has transformed the obsolete technologies with the introduction of smart technology. The upgradation the technological advancement brings a lot of changes in the production of goods and services. The new industrial revolution has brought forth Smart Factories and Smart Manufacturing. Cognitive Computing and Artificial Intelligence are the new technologies emerging in the

contemporary technological age. The MHRD is funding universities to build better infrastructure, resource creation and conducive ambience for learning and gaining quality education. Inclusive growth is the policy of the government to make the educational institutions develop in every aspect to provide standard education to all irrespective of their economic and social strata.

The collaboration between University and Industry will help to identify the needs of the industry and plan research projects according to the societal and commercial needs and attract the best talents with high research caliber to take up research. The future vision of industrial revolution 4.0 urgently requires young men and women with innovative thinking for inventing new things for the future industrial world and in this respect too overhauling research is required in the Indian universities. The government policy for e-governance is being implemented in the universities besides smart and digital learning. The Industrial Revolution 4.0 is accompanied with the vision of Education 4.0 because the future India is going to witness a growth catering to the needs of teeming millions.

ROLE OF UNIVERSITIES IN PROMOTING RESEARCH

It may be recalled that India was known for imparting good education during the ancient times. The ancient Nalanda University was one of the first five best universities in the world then. It was founded in the 5th century BC and reported to have been visited by Buddha during his lifetime. The students studied Science, Astronomy, Medicine, Logic, Metaphysics, Philosophy, *Samkhya, Yoga-shastra*, *Vedas* and the scriptures of Buddhism, which were the noted features of this university. The Indian educational system was highly philosophical with truth seeking nature in every art or field. Now, restoration of earlier golden periods of Nalanda University has to be realised, so as to make the present universities to regain the ancient glory and attain global standards.

Commercialising research and development projects in Indian universities will encourage more researchers to develop their research interest in every field of discipline. The holistic approach of inter-disciplinary research and projects will create new inter-disciplinary courses for imparting new perspectives in every subject. Sponsoring research projects has to be carried out intensively and the young researchers have to be encouraged to bring forth quality in their findings and inventions.

The researchers have also to be encouraged to file patents for their original inventions and discoveries, and get due recognition and acknowledgement for their scientific work and achievements. The scientific inquest and search for finding new inventions and discoveries will make the world a better place to live in and help people derive the benefit of smart and technological improvements to facilitate new ways for doing things easily and comfortably.

The call for Sustainable Development Goals (SDGs) is indeed a universal call reminding all the developing and developed nations to address the social and economic issues with more caution and responsibility. Researches can be carried out to achieve SDGs with the objective of creating a better society with lasting peace and happiness in the world. Scientific temper and perspective must be inculcated in the youth through the education system so as to make them comprehend the natural and social phenomena.

The aptitude for innovation and creativity in Science and Technology will stimulate the research inquest and rigour among the young scientists for creating a technological society to realise the goals of fourth industrial revolution in the field of industry and education. The innovativeness and creativity should also be encouraged among the school children to make them participate in developing Artificial Intelligence (AI) to reduce the work of manpower and use robots and machines for doing the work with ease.

The future world will do only smart work rather than hard work. Everything will be done by machines and robots. This will be possible only with the development of Artificial Intelligence (AI) in every field. So, the Indian universities must be fully equipped to train students for creating a better technological society. Less work by humans and more production by the introduction of smart machines and robots are the goals of industrial revolution 4.0 and it will be in operation for the future industry. This should be taken into account while framing curriculum in institutions of learning.

Excellence can be realised in Indian universities only when the quality of education is improved. Improving the standard and quality of teaching, research and extension should be given utmost care and attention by all higher educational institutions and that is what will enhance and establish excellence in all domains of education. All possible ways and means should be explored and implemented to raise

the standard and quality of teaching and research. Bringing about these changes will not be an easy task to accomplish. The suggestions and ideas of educational stakeholders and activists must be welcomed and given a platform for their innovative ideas to reform our educational system.

The New Education Policy 2020, which is the first 21st century India-centric educational policy, aims at bringing in major reforms to suit the modern needs. With its proper implementation, the Indian educational system will be witnessing remarkable changes in its governance pattern and methods of teaching in schools and higher educational institutions. The entire educational system has to be geared up to adapt to the changes that will occur in the future on account of the implementation of new education policy.

Practical knowledge must be imparted to make students compete at the global levels. Competency in using advanced technology is imperative to make the nation a well-developed one across all fields. The industry requires competent professionals with skills to maximise the production of goods and services in the business sector. Competency will also develop entrepreneurship skills and shape them to become innovative entrepreneurs by creating new job markets to the large pool of young talents. The world job market is always searching for young innovative talents to make their country rich in every field. More innovativeness will lead to more inventions and discoveries in various fields and create a better society with advantages of advance technology and make this world a better place to live in. Excellence is possible with radical changes occurring in the fundamental educational system.

Morality and ethics must be given emphasis and followed scrupulously in research to present a true picture of the findings. Ethical codes of doing research must be taught to the researchers at the very initial stages. Researchers must be encouraged to focus on intuitive and objective ways of doing research to enhance the quality of their researches. The quality of research is one that will give a true, picture of findings and that should be the aim of every research.

The Non-Resident Indians (NRIs) who have settled in foreign countries are contributing a lot to the countries of their settlement. The remarkable talents of NRIs can be utilised by making tie-ups with them. For example, Venkatraman Ramakrishnan won the Nobel Prize in Chemistry for studies on the structure and function of ribosome.

He is now considered a British-American Structural Biologist though he is an Indian. Many such NRIs can be used for promoting research and innovation in Indian Universities.

Every effort should be taken to recognise and utilise the young talent. If it is not done seriously, developed nations will use our young talent for their countries' development. Brain drain is a very big issue; the world is looking for innovative people. The skill of young talents must be acknowledged by our universities. Indian universities have the responsibility to retain the best talents of young scientists by providing them all facilities and sumptuous monetary gains. Otherwise, we will face the issue of brain drain in a bigger way.

Besides having the responsibility to make our students competent and skilled, we also have the responsibility to make the best use of the young talents and recognise their potential and abilities. Excellence is possible only when we acknowledge and recognise the best talents of young scientists. Otherwise, global institutions that look out for and nurture the best talents will recognise and retain them, and make use of them for their nation's development and enrichment.

Last, but not the least, promoting research, innovation and excellence in Indian universities is a very big task. This would only be possible when changes occur in the methods of teaching and research. Adherence to the code of ethics in research is another key factor that need to be given importance, and all resources have to be created to make students competent. Young scientists must be recognised, appreciated and awarded for their meritorious achievements. More research collaborations need to be initiated and integrity in recruiting best faculties with greater potentialities and capabilities will do good for the nation and the society.

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