

Recommendations of the Panel Discussion held on 26th February, 2021

Science education needs to be relooked to make it more enjoyable, participatory at each level. Looking it in the light of NEP, 2020, School of Sciences, IGNOU organised a panel discussion on the theme “**Science Education: Skills and Innovations**” to celebrate the National Science Day, 2021. The topic was chosen from the theme announced by the Department of Science and Technology, GOI for this occasion. The aim of the discussion was basically to highlight the recommendations to mould the science education from theoretical aspect to practical based output using innovations to meet the requirements of NEP, 2020.

Three panellists, Dr. G. Nagarjuna, HBSEC, TIFR, Dr. Debpriya Dutta, DST, GOI and Prof. Ashok K. Nagawat, ILD Skill University, participated in it. The questions which were addressed were

1. How science education can be moulded to inculcate creativity and innovative thinking?
2. How capacity building in education and technology can harness innovations?
3. How science education can be helpful to meet the skill demands of the country?

The key points that emerged out of the discussion are placed as recommendations as follows:

1. An effort should be made to create Science Technology Engineering Mathematics (STEM) clubs to encourage interaction, participation and inhibited exchange of ideas among students at all levels. This would inculcate peer learning. For example, the concept of ‘Pathshala’ needs to be replaced by ‘Chatshala’.
2. As per the existing data, India has yet to emerge as a producer of software in spite of having a huge pool of coding talent. This can be overcome by encouraging creative coding from a young age to enhance logical and analytical thinking.
3. Creating an environment in which talented individual may receive the sufficient encouragement and acknowledgement to pursue and progress towards achieving the goal.
4. Capacity building in science education should be geared towards providing normal solutions to real life problems and support should be provided at each level of education.
5. In the present system, there are parameters for assessing rote learning and problem solving. There should be a system for recognizing and rewarding innovations in addition to the conventional methods.

6. There is a need to create a framework for technological capacity building for the disabled. It was suggested that several available innovative technologies need to be tested and optimized for fulfilling their needs. To achieve the aim for universal literacy, it is necessary to popularize the following tools:
 - Refreshable Braille Display (RBD)
 - learning naYana – the sign language
 - Speech-Input Speech-Output Communication Aid (SISOCA)
 - Visualization Framework to Enhance the Learning (VisFEL)
 - Interactive Teaching Aid for Autistic Children (ITAAC)
 - Intelligent Tutoring System for Learning Disabled (ITS-LD)
 - Mobile Phone Assisted Remote Speech Therapy
7. It is relevant to transform science education from classical computing (i.e. experimental + theoretical) to a combination of experimental + theoretical+ computational sciences, mainly by using the emerging technologies such as Artificial Intelligence, virtual reality, machine learning, quantum computing etc.
8. There is a severe need to educate the educators towards a multifaceted approach of teaching to enable and encourage liberal learning and innovations in budding minds. They should be oriented towards more continuous and comprehensive evaluation system such as 'Open Badges'. They should be capacitated to change their role from mere teachers to able mentors.
9. Science education should be inclusive and holistic with a multidisciplinary approach to address the demands of the 21st Century. Experiential learning, art-integration, sports-integration, empowerment, scientific temper and evidence-based thinking should be kept in mind while designing the curriculum at any level of education.

These recommendations are submitted of wide publicity, so that the IGNOU fraternity may incorporate them as and when required.
