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## **Need for Paradigm Shift in Research and Innovation from Science in Society to Science for the Society**

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### **ABSTRACT**

*There is significant increase in terms of money spent by the Government and corresponding increase in Research Publication in India. Despite tremendous increase in R&D publications we are unable to make an impact as world leader. Moreover, the impact in terms of commercialization of these outcomes is insignificant. The main perspective of research many times is the Individual's academic growth with much less focus on its utilization and commercialization. Hence, it is essential to do well-needed changes. Considering all these, it is highly essential to have a paradigm shift to promote need based research through Innovation to build the nation by aligning research and innovation with values, needs and expectations of the society in a highly interdisciplinary manner. Hence, it is appropriate to shift the focus from Science in Society to Science for Society.*

**Key words; science for society, scientific temperament, open sch**

### **INTRODUCTION**

There are only 2 lac full time researchers in India for a vast population of 1.3 billion. Thus, the scientific workforce density is much lower compare to the even small countries like Chile, Brazil, and Kenya etc. As per the report by UNESCO India has four researcher against 10,000 labour force. It is significantly high for countries like USA and UK where it is 79 per 10,000 labour force. So, on one side there is need for significant increase the workforce and on the other side involve people for responsible scientific research. The government has initiated multibillion rupee investment for research, education and innovation which has resulted an increase in yearly publications comparable to France, Japan Italy, and Canada etc. Though, some challenging issues like quality of research in terms of its citations and patents generated still remains. Further, migration of many best brains and brightest scientific experts to USA and Europe add to problem.

### **Build scientific temperament from school days**

School curriculums should align to societal needs and new methods of teaching. Students from their school days should learn to address the societal problems and engage them in activities that allow them to see themselves as scientists engaging in the authentic practices of science. It should reveal the connection of science to a student's everyday life. It should work as a guide to the students as they build their conceptual understanding of science principles. It should give the ability to students to see the world from a new perspective.

### **Open Schooling**

Open school are those where the schools work in cooperation with other stakeholders for the wellbeing of the community.]It is highly essential and required to promote the idea of the Open Schooling, if we want to achieve the cherished goal of Education for All. Open schools has the potential to revolutionise the society by large. This development will motivate the learners who were hitherto beyond the reach of education , rural

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youth, disadvantaged sections of society, women, and child labourers for whom access to education was till now denied unfortunately owing to a multitude of problems.

### **Radical changes needed for research and Innovation**

It requires highly interdisciplinary multi stakeholder approach involving Industry, public sector, citizens and end users to take the advantage of knowledge and new perspective to witness desirable impact of research and innovation in terms of utilization and commercialization. Hence, it is highly essential to do radical changes in accordingly to keep pace digitalization and globalization. It should also address the societal challenges and increased demands.

### **Encouraging reuse of the data generated**

The very fundamental basis of research is the work carried out and data obtained by the previous researchers. In this context, open access journals and reuse of data is highly recommended. This will result in more data available for reuse. The action will generate pathfinder case studies for innovative sharing and re-use of research data generated by tax payers money / publicly funded Projects. Moreover, data sharing and data re-use can generate/ demonstrate a ground breaking innovative product, service, or treatment. Thus with wider accessibility of results available is expected to have better reproducibility of research. Additionally, re-use of research data can amalgamate interdisciplinary research, which is essential for addressing the grand challenges of present world.

### **Responsible research and innovation**

Basically research and innovation has to align with the values, needs and expectations of society. In addition, it should be in close cooperation between all concerned. Moreover, transformation in science education, reuse of data generated and research results, open schooling, and the application of new knowledge has to be without a gender bias and in fulfilment with ethics considerations.

### **Gender equality and Prize for woman researcher**

It is appropriate to remove gender imbalance in recruitment and career progression of female researchers. As per the reports the women share in research is much lesser and they are underrepresented in innovative enterprises. Moreover, there is need for recognizing the role of women researchers for their innovations and outstanding achievement by introducing Prizes. Prizes should be given the women researchers who are able to transform their ideas in to new advanced products /services for the society.

### **Conclusion**

A paradigm shift in research and innovation from science in society to science for society will help citizens and organizations to open a new chapter of their development through joint research and innovation scheme. It will be achievable by making changes in curriculum and method of teaching, open schooling, radical changes for research and innovation, reuse of data generated and gender equality. It will contribute to the implementation of Responsible Research and Research Performing through various changes.

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