

National Research Foundation: Fostering Scientific Culture in Academia

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Abstract: National Education Policy 2020 has outlined the base of the National Research Foundation (NRF) to encourage outstanding research in universities and colleges with a vision of transforming the Indian economy into a knowledge-based economy to come across the expectations, challenges and requirements of the 21st century. The main motto of the National Research Foundation is to produce quality research leading to innovation. This also focuses on creating a linkage between industry and academia for an efficient institute-industry collaboration. There is a dire need for scientific culture in academia to produce quality research. Scientific culture is a contagious process that enhances scientific attitudes among academicians. Curiosity and creativity are the fundamental pillars of scientific culture and lead to research and innovation. The results of scientific inventions are never confined within the boundaries of a nation, while their fruits are tasted all over the globe. In India, the rate of scientific inventions is quite slow. However, the NEP 2020 has come into the process of implementation covering all aspects of quality education and research to produce innovations in India. Education should adequately enhance scientific culture in academia to cause a sense of responsibility among learners and academicians for producing quality research work leading to innovations. Fortunately, the NEP 2020 aims to improve India's education system and transform it into a 21st century educational system in line with all of these important issues. The present paper highlights how the National Research Foundation fosters a scientific culture in academia.

Keywords: NEP 2020, National Research Foundation, Scientific Culture, Academia

1 | INTRODUCTION

In most cases, success is assessed based on the job; the more an individual earns, the more likely they are to be successful. This culture influences an individual toward a job. The examination system lacks in focusing conceptual clarity and generating new ideas. This pushes students toward cramming even

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unwillingly. Conceptual clarity, content mastery, and writing skills are essential outcomes of quality education. The students are often expected to answer in the set format in the examination to obtain a degree. This shows that knowledge remains limited to the limits of marks and degrees. This has smothered the massive field of innovation, quality education and research. This has created a thin layer of examinations, marks and degrees. Consequently, marks and degrees have been used as substitutes for learning and understanding. Such an examination structure cannot create an adequate scientific culture in academia. For this reason, over the past few years, approximately half of the engineering seats have remained vacant.

Godin and Gingras (2000) highlighted that there are numerous motives for valuing scientific culture. Cultural development of citizens, as a prerequisite for economic development and innovation, as well as social aspects to enable people to understand the scientific basis of modern society so that they can play an active role in social debates, are seen as its value. Bhagat (2007) stated that the number of patent applications documented by Indians did not reach the mark. According to a report, in 2010, Indians submitted approximately 6000 patent applications while Japanese and American patents recorded approximately 4.5 million and 4.2 million patents respectively. Only 3% of all patent applications filed on Earth were documented by Indians. This shows a lack of innovation and creativity among Indian academicians. In most cases, research occurs under the supervision of a supervisor rather than with an advisor in either a verbal or written format. All these issues result from low scientific culture. It is necessary to revise and restructure the education system to promote a scientific culture among young people and academicians.

After all these relevant issues have to be addressed, fortunately, National Education Policy 2020 has focused on ameliorating the Indian education system and transforming it into 21st century education system. It envisages producing truly global citizens but they must possess Indian ethos not only in thoughts but also in spirit and deeds. Feur et al. (2002) stressed on posing relevant questions, connecting research to relevant theory, and facilitating a coherent and explicit chain of reasoning.

Scientific culture refers to rationality in thoughts, words, values, patterns, and all spheres of human life to make the world more beautiful, healthy and happy. The essential features of scientific culture depend on solving any cognitive and practical problem with facts and replication (Yuan, 2022). Since the aim of education is not simply to make students aware of scientific realities and ideas but also to make individuals aware of the advantages of utilising logical reasoning in close to personal and public life, the dispersal of scientific values is an essential piece of the educational procedure of learning (Kumar & Singh, 2017). The teaching-learning process, and development, publication, and application of research findings on scientific knowledge pave the way for scientific culture in academia; this culture is known as scientific culture (Vogt, 2012). Scientific culture helps people become curious, creative, and scientific toward the environment, planet, and human spirit. A scientific temperament strengthens the setting of research and innovation for sustainable development as NEP 2020 has envisioned National Research Foundation to make India Viksit Bharat. NRF will facilitate people in all possible ways to conduct research in all neglected areas that are of immense importance for the welfare of humankind as promoted through NEP 2020.

2 | NATIONAL RESEARCH FOUNDATION: ENRICHING SCIENTIFIC CULTURE

NEP 2020 conceives the foundation of NRF to create a genuine commitment to the development and improvement of quality research on different components in a synergistic manner. The fundamental objective of NRF is to encourage a culture of investigation and research in colleges and universities. In Specific, the NRF will facilitate funding to a solid base for meritorious and blind peer-reviewed research, and make a difference in creating a research environment through reasonable reinforcement of exceptional research and innovation. The NRF will award competitive funding in all areas of research (NEP 2020, 17.6). To ensure the synergy of objectives and prevent duplication of efforts, the NRF will

work closely with other funding agencies along with scientific, engineering or other academic institutions. A rotating board of governors, composed of the best researchers and innovators in various fields, will manage NRF independently from the government (NEP 2020, 17.10). The National Research Foundation aims to increase India's investment in R&D from 0.7 % of GDP up to 2 % by 2030. In absolute terms, India's R&D expenditure increased from \$23.8 billion in 2010 to \$89.9 billion in 2019. This also aims at increasing India's share of world scientific publications; establishing a pool of highly qualified researchers in all fields and sectors to solve development challenges for India, as well as translating scientific knowledge to tangible societal and economic benefits (Saraswat et al., 2023).

2.1 Scientific Culture and Academia

Scientific culture consists of a set of norms and practices, an ethos of integrity, openness or continuous reflection, and research quality evaluation (Feuer et al., 2002). Scientific knowledge covers knowledge of products of science, science learning procedures and practices of science with educational perspectives that bridge the gap between theory and practice (Kumar & Singh, 2017). Scientific culture is a set of practices and regulations infusing rationality, curiosity, creativity, integrity, and fidelity. It generates a sense of curiosity and a tendency to learn about the latent. It widens the scope of education. Academia is an environment where academicians exist in a particular region. They are concerned about the quest for knowledge, education, research and innovation.

2.2 Role of Scientific Culture in Academia

Wang (2018) has rightly expressed that scientific culture shapes a basic and solid foundation for a nation to become a world leader through science and technology. However, in the true sense, it is not confined to science and technology, it extends beyond science and technology to other disciplines. An examination framework, for the most part, comprises two semesters or yearly exams in India. The purpose is to examine the content mastery of what a learner has learnt within the period and syllabus. However, it does not influence creativity nor promote scientific culture. Therefore, the focus remains on securing higher marks to obtain academic status rather than exploring ideas. Scientific culture plays a vital role in academia. It focuses on conceptual clarity, spontaneity, original thinking, natural writing skills, content mastery, and application to personal and public life. In that case, it will be conducive to the learners, academicians and nation. At present, education should be more applicable to personal and societal life. Its core objectives should be included, i.e., scientific temperament, curiosity, creativity, righteousness, and courage for research and innovation as NEP 2020 has drawn a holistic picture of the education system. NRF would be a lifesaver for the scientific culture in academia leading to research and innovation.

3 | EMERGING CHALLENGES IN ACADEMIA

Shri Pranab Mukherjee, former President of India, expressed that instead of critical research, the lack of an appropriate atmosphere in academia pushes talented people toward routine work. There are reputed IITs, NITs, and IIMs where nearly 100% of campus recruitment is performed. However, no Indian scholar who worked at an Indian university has ever been awarded a Nobel Prize since C.V. Raman did so in 1930. The nation would have been much better off if they had given themselves the time and energy to research it, (as cited in Bhagat, 2017). It demands an education system that can provide a scientific culture in academia requisite for creativity and innovation.

Two graphs show India's scientific publications in predatory journals. The figures below exhibit the distribution of 480 respondents across several academic disciplines and positions (Seethapathy et al., 2016).

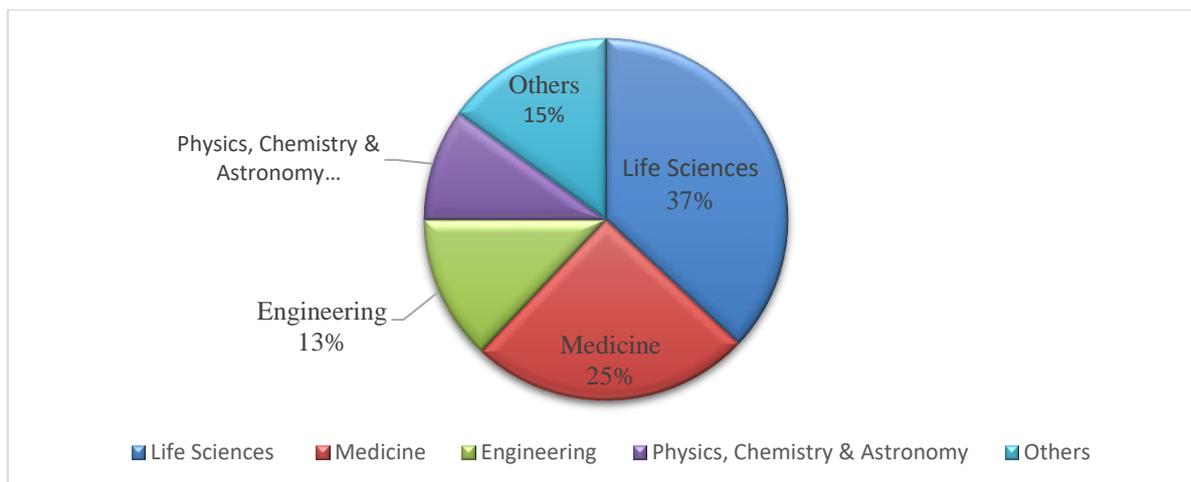
Figure 1: The academic discipline of corresponding authors in the predatory journal

Figure 1. Note: Adapted from "India's scientific publication in predatory journals: Need for regulating the quality of Indian science and education" by G. S. Seethapathy, J. U. S. Kumar and A. S. Hareesha, 2016, *Current Science*, 111(10), p. 1762.

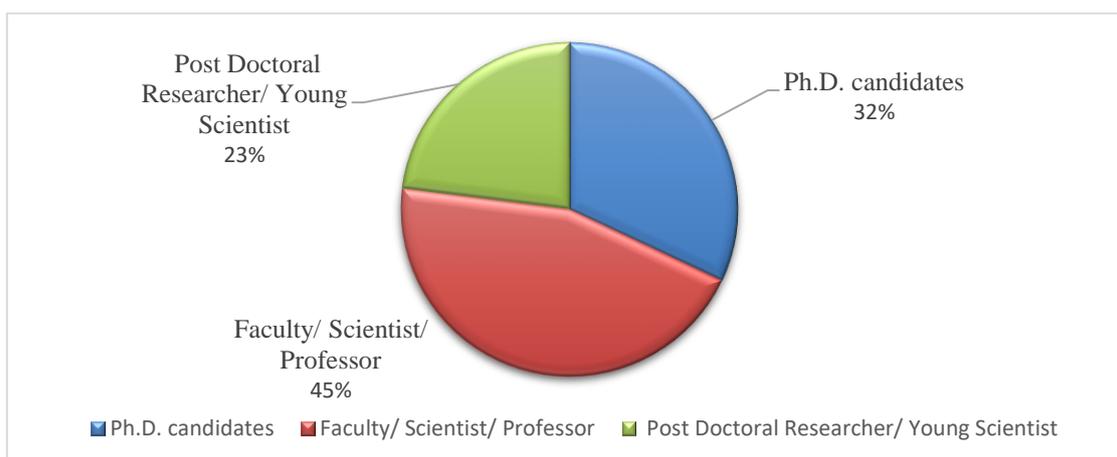
Figure 2: Academic position of corresponding authors with predatory publications who responded to the online questionnaire

Figure 2. Note: Adapted from "India's scientific publication in predatory journals: Need for regulating quality of Indian science and education" by G. S. Seethapathy, J. U. S. Kumar and A. S. Hareesha, 2016, *Current Science*, 111(10), p. 1762.

These figures show the percentages of academic disciplines and corresponding authors in predatory journals. This has led to severe and emerging challenges in India. Therefore, education must imbibe the application of content for research and innovation. Therefore, the NEP 2020 has emphasised the National Research Foundation for quality research and innovation to make India self-reliant. In society, most people feel reluctant to conduct research which leads to a sluggish scientific culture. The curriculum combined with scientific culture promotes research and innovation among learners and people. The first and foremost requisite for scientific culture was to revise the curriculum and examination system. NEP 2020 has performed a marvellous task after restructuring the pedagogical and curricular structure as 5+3+3+4 from 10+2. The policy has also emphasised formative evaluation which means continuity and comprehensiveness in assessment. Therefore, this examination system can curtail the race to acquire better marks and a coaching culture. The culture of scientific research involves different elements that distinguish the methods academicians use to create and generate scientific information and knowledge from other fields of study (Lunetta *et al.*, 2007; Taras *et al.*, 2009, as cited in Dewey *et al.*, 2021).

4 | NATIONAL RESEARCH FOUNDATION: PROMOTING QUALITY RESEARCH AND INNOVATION

The objectives of the NRF are to provide funding for quality research proposals of all types in all areas of research after the blind peer-review process and to encourage research, especially in all those colleges and universities where there is a dearth of research or in the initial stage. NRF will act as a bridge between investigators and academic institutions, industry and different divisions of government. Therefore, researchers can remain aware of relevant and urgent issues of national importance (NEP 2020, 17.11). Reddy et al. (2024) explicate the importance of the NRF as a noteworthy step toward the enhancement of the research ecosystem in India. The formation of the NRF in line with the NEP 2020 aims to build a strong environment for research and innovation, necessary for the country's development and global competitiveness. The NRF can transform India into a hub of research and innovation tackling the challenges and taking advantage of sincere efforts.

Kumar et al. (2020) stipulated the relevance of NRF with a view to a unified direction and promotion of research and innovation in higher education at the global level. Reddy (2023) explicates that "NRF should promote multi-institutional, inter-disciplinary research to address prioritised areas of India's development by funding both commissioned task force research and investigator-initiated collaborative research. Mindsets for engaging in multi-disciplinary research must be created early in scientific careers, by inviting young researchers (such as post-docs from different knowledge domains) to collaborate on problem-solving research in identified areas where progress needs to be speeded up or solutions are currently unavailable" (p. 11). Singh (2022) asserted that NRF aims at bridging the gap through its specific approach towards promoting research culture and innovation by strengthening integrated planning and coordination, research culture and critical thinking in higher education institutions.

5 | CONCLUSION

It has been widely accepted that curiosity and creativity are sources of invention, so education must infuse a sense of curiosity and develop a scientific temperament to enhance scientific culture, research attitude and verve for innovation among learners. Content mastery is not adequate to contribute to the sustainable development of a nation. The National Research Foundation is an example of the policy to add quality research to the pool of knowledge. This would also guide and encourage the researchers, academicians and policymakers to focus on quality research leading to innovation and scientific culture to pave the path for research environment. It is essential to improve the extent of education among learners to develop interest and curiosity for research. Therefore, NRF can enhance scientific culture in academia to accelerate the speed of genuine research. In this way, it is understood that scientific culture is highly important in academia. NRF is the first step to revolutionise academia for producing quality research and increasing the number of patents in future.

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Dr. Manish Agrawal has completed M.A. (English), M.Ed., Ph.D. (Education) and postgraduate diplomas in Data Analytics with SPSS and Guidance and Counseling. He has qualified UGC NET- JRF (Education). He has published research papers in national and international journals. He has acted as a resource person in SAHYOG and MANODARPAN sessions conducted by NCERT, an initiative of Ministry of Education, Government of India. He contributed significantly for NAAC reaccreditation as a member of IQAC at RIE, NCERT, Ajmer, Rajasthan, India.

Dr. Usma Nazir, holding a Ph.D. in Education from the prestigious Aligarh Muslim University, alongside an M.A. in Education from Central University of Kashmir & B.Ed. from her alma mater, the University of Kashmir, exemplifies academic excellence. With a solid foundation built upon her extensive education, Dr. Nazir boasts four years of invaluable experience in both teaching and pioneering research at the university level. Her academic pursuits are a testament to her passion for advancing education, with a keen focus on Teacher Education & Educational Psychology. Dr. Nazir's intellectual curiosity and dedication to her field have led to a prolific publication record in internationally recognized journals, including *Scopus Elsevier*. Furthermore, she lends her expertise as a board member and esteemed editor for several prestigious international journals, contributing to the scholarly discourse in her areas of specialization.

Dr. Ibrahima Haneef received her degree of Bachelor of Science in Physics and Mathematics from Mahatma Jyotiba Phule Rohilkhand University, Uttar Pradesh, India, Master of Science in Mathematics from Aligarh Muslim University, Uttar Pradesh, India. She has also pursued Bachelor's and Master's degree in Education from Aligarh Muslim University, Uttar Pradesh, India. She obtained her Ph.D. Degree in Education from Aligarh Muslim University, Uttar Pradesh, India. She did a Post Graduate Diploma in Data Analytics with SPSS and a Post Graduate Diploma in Guidance and Counseling from Aligarh Muslim University, Uttar Pradesh, India.

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