

# Revitalization of Scientific Temperament in Indian Education System: Role of NEP 2020

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**Abstract:** *Scientific temperament is generally considered as a philosophy and a way of thinking which has played a significant role in the development and growth of Humankind. Scientific temperament is regarded as a catalyst of modern growth and almost every aspect of human thinking can be shaped by this thought process. In India, the growth of scientific temperament and its current status is a matter of debate which is shaped by politics. Nevertheless, the need of it is never disregarded in current Indian society, only its importance is diminishing.*

*The New Education Policy 2020 (NEP 2020) which is formulated to revitalize the current education system also give importance to the development of scientific temperament but will it be able to revitalize it, is the main question which this paper aims to deal. This paper looks at the history and development of the concept of scientific temper in India. Then, this paper studies the current scenario in India regarding scientific temper. Lastly, this paper studies the NEP 2020 to ascertain whether it is enough to revitalize the scientific temper or not.*

**Keywords:** Scientific Temperament, Science Education, NEP 2020, Science and Technology

## I. INTRODUCTION

Indian education system is an old system which has produced many geniuses. The Indian education system has produced several renowned innovators, technology enthusiasts, scientists, doctors, lawyers, etc., who have contributed immensely to the development in their respective fields. All of this is possible because the Indian education system inculcates learning based on critical thinking and application of logic. The Indian education system affirms the need of scientific temperament, as envisaged by the first Prime Minister of India, Jawaharlal Nehru.

But recently, the Indian education system is facing challenges. The Indian society is getting easily influenced by several factors that can lead to the undoing of the decade's old development. The scientific temperament has been tossed into the dustbin and it's on the way to being replaced by the deep-rooted social stigma, religious prejudice, irrational practices, and superstition. Therefore, to prevent this, there is an urgent need of reforms. The New Education Policy of 2020 (NEP 2020) has been developed to replace the old education policy. The NEP 2020 is said to be modern and it is said that it will include the scientific temperament. Thus, the question remains that whether this NEP 2020 will help in revitalizing the long-lost scientific temperament in the Indian society?

## II. SCIENTIFIC TEMPERAMENT IN INDIA

There is no specific definition of scientific temperament available but generally scientific temperament has been described as an attitude and thinking which encompasses the logic, fair understanding, thorough analysis, equity and conscience. The scientific temperament should not be equated to the understanding of scientific concept or technology or scientific phenomenon but it is much more than that. Scientific temperament is much more philosophical and pedagogical, which fosters critical thinking and application of logic in understanding any situation and condition.

The credit for the growth of scientific temperament in India undoubtedly goes to the first Prime Minister of India, Jawaharlal Nehru. Nehru first used the term "scientific temper" in his widely acclaimed and highly honoured book "The Discovery of India" wherein, he described his views on scientific temper as a state of mind which is free from

superstitions, prejudice, rigidness, irrationality, close mindedness and other deep-rooted traditions which are holding society back. Nehru was a firm believer of growth and economic development thorough scientific temper and he disregarded the superstition and deep-rooted stigma present in the Indian society back then. In his book, he advocated for the scientific temper by describing it as: *“the refusal to accept anything without testing and trial, the capacity to change previous conclusions in the face of new evidences, the reliance on observed fact and not on pre-conceived theory”*.

India after independence was engulfed in societal issues including precedent poverty, illiteracy, nil economy due to no industries, and most importantly, lack of unity due to religious divide and regressive practices such as untouchability. Furthermore, the huge part of the populace was underdeveloped due to the evils of imperialism. During that time, it was only due to the Nehru’s thought process of scientific temperament that India after independence was able to achieve significant strides in the development of science and technology. India subsequently accomplished many milestones such as becoming as atomic power, development of ISRO and subsequent milestones in space exploration, development of world class educational institutions such as IITs, and AIIMS, IT Revolution, Green Revolution, and, etc. Furthermore, India contributed heavily to the globalization by developing industries. All this was possible because of the change brought in the perspective and thinking of common Indian due to the inculcation of scientific temper. The Indian population was able to achieve its potential by applying the scientific approaches to solve their problems and it was a good indicator of evolution of scientific temperament in the society.

The development of scientific temperament is also a Constitutional duty of every citizen of India. The 42<sup>nd</sup> Amendment to the Indian Constitution in 1976, inculcated the list of Fundamental Duties, wherein, Article 51-A(h) talks about the development of scientific temper. As per Article 51-A(h), every Indian citizen should develop *“the scientific temper, humanism and the spirit of inquiry and reform”*. The scientific temper in India, which is one of the most diverse countries in the world, addresses the diversity and it has power to bring the positive change in the set notions of the population. Hence, scientific temper is much of a social tool as much as it is a Constitutional duty.

There exists a correlation between the scientific temper and the economic growth. This correlation was envisaged by the Nehru, way back, and this led to the foundation of unprecedented economic growth of India. Developed western countries like USA, Germany, UK, etc. realized this correlation and they put in place a system of education where priority was given to scientific temper and logical thinking. In India, after independence, huge efforts were made by our elected leaders, academicians, officers, as well as the teachers, for developing scientific temper and make India free from the regressive practices. Nevertheless, a lot is still yet to achieve and currently, it seems that India is going backward, at least in this area. The next section of this paper deals with the current status in India with regard to scientific temperament.

### **III. CURRENT STATUS AND NEED FOR REVITALIZATION OF SCIENTIFIC TEMPERAMENT IN INDIA**

It is self-evident that development of scientific temper led to the socio-economic change at many levels in India. In past, India was able to prevent many catastrophes due to its right policies of inculcating the logical and rational thinking, free from evil clutches of superstition, and prejudices. The availability and production of important antibiotics against several prevalent ailments has extended the average life span of Indians. Likewise, the introduction and development of IT sector, led to the availability of televisions, cell phones, the widespread use of computers, and the internet has led to an increase in communication capabilities. However, India still faces the issue of availability and accessibility of quality education, and resources. The benefits of the growth of scientific temper are not equally shared by the people from different backgrounds, castes, or geographical locations.

The last decade has seen the uprising of religious divide, caste divide, disharmony, and, increase in regressive thinking in the populace. This has undone the several developments which the country has made in the past. The scientific temperament has taken a setback in the country in almost all the policy decisions of the government.

The Proponents of scientific temperament have frequently battled the evils of superstition and religious prejudices. The primary opposition of the scientific temper is the religious prejudices which are deep rooted in the society. Scientific temper is thus an "ideology" that opposes these ideologies that are centred solely around religion. It is self-evident, if we look around the world and studies the socio-politics of several nations. The western nations which are developed

and which are contributing to the science and technology have largely separated their policy decisions from the clutches of religious prejudices like Japan, China, USA, Germany, etc. Whereas, the nations which prioritized the religious prejudices in their policy decisions are on the path of destruction, for example, Pakistan, Afghanistan, Sudan, etc. Sadly, India is on track to acting like the latter nations.

Due to the widespread use of electronic media, such as TV and the Internet, both public and private activities are always visible to the public, and a large portion of the content can be saved and retrieved. Scientists that engage in such behaviour undermine their credibility as leaders in the field of scientific temperance. The main aim of these institutions has been lost due to the increase in religious prejudices, superstition, and stigma in the policy decisions of the government. Many of these behaviours of people in power are justified under the mask of "culture". But the populace has to introspect and determine that is this our "culture"? Can we take a risk to put a break on scientific temperament to normalize religious prejudices, superstition, and regressive thinking, at this stage? Therefore, to uphold its constitutional mandate, the country needs to introspect and align its goal. The government should instead focus on inculcating the scientific temper and logical thinking, while dealing with policy issues.

The recent spurt in providing legitimacy to the 'occult' by dubbing it as scientific is a disturbing phenomenon. There has been increase in the pseudo-science being regarded as "science" by our elected leaders, spiritual leaders, as well as academicians. This has been seen as a setback for the scientific temper. The only ray of hope for the Indian populace is the NEP 2020, which has at least acknowledged the need for inculcating the scientific temper in the young minds. In the modern, globalized world, the science is paramount and "being scientific" is a mark of superiority and source of pride. But due to the current stand of the Indian government, there exists a serious possibility of "pseudo-science" being taught as "science" under the NEP 2020. Nevertheless, a lot depends upon the implementation of this policy and we can only hope that this policy brings about the much-needed positive change in the mindset of our country. The next section of this paper deals with the scientific temperament as envisaged by the NEP 2020.

#### **IV. WILL NEP 2020 BE ABLE TO REVITALIZE THE SCIENTIFIC TEMPERAMENT?**

There have been several recommendations of NEP 2020 related to science education, which has the objective of developing the scientific temperament in the country. The NEP 2020 is a policy developed to revitalize the Indian education. The NEP 2020 revitalizes the science education, as well. A close inspection of the recommendations is needed to understand the objective of this policy and to answer the question of "will it be able to revitalize the scientific temperament?"

The recommendations related to science education put forward in the NEP 2020 are:

##### **Restructuring school curriculum and pedagogy in a new 5+3+3+4 matrix:**

The current 10+2 matrix will be change to the new 5+3+3+4 matrix, wherein, **5years** are Foundational Stage (3 years of pre-primary and 1<sup>st</sup>, and 2<sup>nd</sup> grades), **3years** are Preparatory Stage (3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> grades), **3 years** of Middle Stage (6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grades), and **4 years** of Higher Stage (9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> grades). All these grades will have special focus on the discovery-based learning and general skill development. Furthermore, the skills will be developed from general to specialist gradually and in a step-by-step manner throughout these stages. As per the recommendations, throughout these stages, critical thinking and logical thinking will be fostered in the young minds.

##### **Reorganization of curriculum:**

The current school education system will be reoriented in order to foster the holistic development, critical thinking, and, logical thinking, collaboration/teamwork, social responsibility, multilingualism. Special focus will also be given on the financial as well as digital literacy development in the students. Thus, rote-learning will be replaced and logical and evidence-based learning will be encouraged in the NEP 2020.

##### **Reduction in the curriculum:**

The contents of several subjects will be reduced to only important and essential content. This will make a room for the holistic education. The teachers will not be bound by the time and they will be able to focus more on giving example-based learning and they will be able to foster deep learning of the essential content only.

##### **No strict separation of subjects under the heads of curricular, extra-curricular, or, co-curricular.**

All subjects are given equal importance under the NEP 2020. Be it carpentry, sculpting, yoga, music, etc., every subject is considered at par with the traditional theoretical subjects like science, and arts. These subjects will be added into

curriculum of NCERT and states governments will have the power to edit them as per their needs. This change will lead to the development of skills in the students and it will give them more choice and freedom to study whatever they feel interested in. Furthermore, the separation between the vocational and academic subjects will also be removed. This will be instrumental in developing life skills in the students.

**No hard separation of subjects:**

All students will be able to choose subjects of their interest and there will be no hard separation of arts and sciences. This is a positive step as it will foster diverse learning and holistic education. Students will get a chance to pursue their interest and will not be bound by the hard separation of subjects, which often led to the decrease in choices. This step is also positive for the reason that several subjects are interrelated and studying them together will help student to understand the concept in a better and holistic way.

**Bilingual learning:**

Science learning will be done in the local languages as well. This will help the students who preferred their local language over English or Hindi. This will be beneficial because it will not limit the science learning on the basis of language and it will provide freedom to students to study the science in their own language. They will be able to learn it and teach it, more efficiently.

**Encouragement of scientific temperament and holistic learning:**

Evidence-based learning, and logical thinking will be given importance and will be practised in the school's curriculum. This will also uphold the Constitutional mandate and will foster the scientific temperament amongst the students.

**V. CONCLUSION**

The scientific temperament, as envisaged and developed by the Nehru has taken a setback during the past decade. This setback is on the way to undone the decades of progress made through science and technology. The rise in the religious prejudices, irrational thinking supported by regressive thinking, stigma, and superstition amongst the population is harming the national and its economy. Furthermore, the Constitutional ethos has been disregarded in the name of "culture" and "religion".

The recommendations put forward through NEP 2020 is a positive step in inculcating and revitalizing the scientific temper in the Indian society. The recommendation, as discussed above, may led to positive change, if implemented correctly and in it's true sense. These recommendations are sound but again, as a policy instrument, their implementation should be free from the clutches of religious prejudice, superstition, and "culture".

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