International Journal of Multidisciplinary Approach Research and Science
E-ISSN 2987-226X P-ISSN 2988-0076
Volume 2 Issue 01, January 2024, Pp. 371-377
DOI: https://doi.org/10.59653/ijmars.v2i01.471

Reorganizing the Structure of Indian School Science Education with reference to Committees and Commissions

Sagnika Dash[1*], Chandrasekhar Bhoi[2]
Nalini Devi Women's College of Teacher Education, Bhubaneswar, India | sagnikadash5@gmail.com[1]
Maharaja Purnachandra Autonomous College, Baripada, India | cbhoi7918@gmail.com[2]
Correspondence Author*

Received: 03-12-2023 *Reviewed: 05-12-2023* *Accepted: 15-12-2023*

Abstract

National Policy on Education reiterated the integration of India's culture and heritage with scientific thinking and scientific discoveries. Imparting formal education has enormously changed over the years in India with integration of science education in the curriculum and emergence of the idea of digitalization of education. Scientific progress brings about amelioration of individual and social development. For scientific progress to occur, not only the science research centers should be expanded and developed but fundamentally the schools, colleges and universities imparting science education must be strengthened in quality. This article discusses in retrospect, about the referring to the recommendations of various committees and commissions of pre and post-independence period, in attempt to provide a comprehensive picture of development of a holistic education system in India.

Keywords: Science education, school education, committees, commissions, NEP-2020

Introduction

India has contributed significantly to the emergence of modern science (Chakrabarty et al., 2023) (Price, 2023). India, a leading nation in science, has a rich scholarly tradition of science (Basak et al., 2023), the roots of which traces back to ancient India (Maganga & Taifa, 2023). This country is motherland of great mathematicians and scientists such as Aryabhatta, Pathani Samant, C.V. Raman, Homi J. Bhaba, Dr. A.P.J. Abdul Kalam. Talking about the value of science (Hoyningen-Huene, 2023), it is right to say that no aspect of development is left untouched by science in the present world (Stojanovic, 2023). Science is vital for human existence(French & Murphy, 2023). Strengthening Science education plays the key role for accelerating technological advances and scientific research and innovation (Murphy, 2023).

Reorganizing the Structure of Indian School Science Education with reference to Committees and Commissions

Scientific knowledge helps people understand myriads of phenomenon in the world (Bagwan et al., 2023).

Historical Retrospect

The significant landmarks in the development of science education in India are discussed below.

Pre-Independence provisions

Hunter Commission-1882-83

This commission recommended opening of Govt. run model schools in each district; and revision of secondary school curriculum with academic and vocational courses diversified into different branches. It is noteworthy that between 1882 and 1901, there was a remarkable rise in the number of students enrolled in primary and secondary schools.

Saddler Commission 1917-19

Saddler commission is well-known for planting the seeds of +2 stage or junior college system in the education system. It first suggested the creation of intermediate colleges which would provide instructions in Arts, Science, Medicine, Engineering, Teaching etc.; to be run as independent institution or to be attached to selected high schools.

Hartog Commission 1929

For development of science education, this commission suggested for a more diversifies curriculum in the schools, preparing middle school students for specialized education in technical and industrial schools. In view of enhancing the exposure and expertise in the field of teaching-learning science, this commission suggested that refresher courses and training programmes should be offered to teachers. Besides, this commission advocated for imparting sex education and environmental education as important aspects of education.

Wardha Scheme of Basic Education, 1937

It is another milestone in Indian education which insisted that education should be centered around productive work i.e. integration of education to physical environment,, social environment and craft work.

Sargent Report, 1944

Considering the importance of industrial growth, one of the significant recommendations of Sargent report related to science education included preparing senior-basic or middle school students(aged between 11-14) for industrial occupation.

Post- Independent Policies

After India got its independence, we realized the vitality of science for social transformation and economic development. C.V. Raman, one of the eminent scientists of India

said, "There is only one solution for India's economic problems and that is science, more science and still more science."

Secondary Education Commission, 1953

Secondary Education Commission (1953) advocated that science should be a part of curriculum from primary school to undergraduate courses. All India seminar on Teaching of Science was held in 1956 which paved the way to formulation of Scientific Policy Resolution of 1958. This comprehensive document envisioned cultivation of scientific research in all its aspects- pure, applied and educational. This policy aimed to ensure adequate availability of research scientists of the highest quality within the country; to encourage training programmes for scientific and technical personnel to fulfill the country's needs in science and education, agriculture and industry, and defense; to encourage acquisition and dissemination of knowledge and for the discovering of new knowledge in an atmosphere of academic freedom; to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge.

National Council of Educational Research and Training (NCERT) established in 1961 has a distinct department of science education which predominantly works for providing schools with IT-based learning materials in support of the curriculum.

Indian Education Commission, 1964

Indian Education Commission(1964) chaired by Dr. D.S. Kothari emphasized the significance of science education in India and recommended that: Science should be an integral part of education, should be studied as a single subject, teaching of environmental science in primary schools. It stressed on science being a compulsory subject for all students upto class X. It also recommended up-gradation of curriculum, revision of learning resources.

National Policy on Education in 1968

As a remarkable step in the history of independent India, Government of India announced the National Policy on Education in 1968 which stressed that "Science education should be an integral part of general education".

National Policy on Education, 1986

National Policy on Education, 1986 reemphasized teaching science as a single subject and advocated that science education should be compulsory at secondary level. It recommended "science education for all". It posited that science education should be designed so as to enable the learners with problem solving and decision making skills as well as the ability to correlate science with health, agriculture, industry and other aspects of daily life.

Acharya Rammurthi Committee, 1990

This committee report outlined the importance of work experience or socially useful work (S.U.P.W) to be linked with various subjects both and the level of content and pedagogy.

POA, 1992

The plan of action, 1992 was yet another source of visionary ideas towards improving Indian science education substantially.

It focused on the development of scientific knowledge and advocated for a system of science education fulfilling the needs of 21st – century. It envisaged opening of Navodaya Vidyalayas across the nation to promote talented students of rural areas by imparting quality education and preparing scientific minds.

Yashpal Committee, 1993

Well-known for its concept of learning without burden, Yashpal Committee highlighted the importance of curricular reform. It also suggested enriching and enhancing scientific and technical resources in educational institutions; and strengthening research work in universities.

STI Policy

The Science, Technology and Innovation policy of India aims to accelerate research and innovation in it's higher education institutions and enhancing capacity development for inculcating and promoting scientific temper across the country. It also aims to develop scientific literature and media across Indian languages and geographies to maximize the number of people that participate in and contribute to the scientific discussions and processes in the country.

NCF, 2005

National Curriculum Framework which serves as the guideline for syllabi, textbooks and teaching practices for the schools in India, holds the view that the major aim of science education is to enable each learner to acquire theoretical knowledge, practical technological skills and inculcate scientific temper. Teaching learning science in innovative and learner-centric methods rather than the traditional teacher-centric methods is recommended. Emphasis on hands-on experience and active participation of learners is encouraged.

National Education Policy, 2020

National Education Policy-2020, the cornerstone of 21st century science education, recognized the gaps in the system and identified that there exists lack of implementation of what is learnt. The purpose of science education is to ignite curiosity in learners, to develop scientific attitude and promote critical thinking. It has made recommendations to introduce technology and advanced science into secondary level. It encourages learners to adopt a self-directed learning approach that will help them develop an inquisitive mindset towards science as well as life at large. It advocates for accruing the practices of research in science education to promote inculcation of scientific temper.

Contemporary Initiatives and Prospects of Science Education

The new Science, Technology, Innovation Policy (STI policy) aims to bring about profound changes by building a nurtured ecosystem that promotes research and innovation on the part of both individuals and organizations.

This policy will be guided by the following broad vision:

1) To achieve technological self-reliance and position India among the top three
2) scientific superpowers in the decade to come.
3) To attract, nurture, strengthen and retain critical human capital through a 'people
4) centric' science, technology and innovation (STI) ecosystem.
5) To foster, develop, and nurture a robust system for evidence and stakeholder-driven
6) STI planning, information, evaluation, and policy research in India.
7) Enhancing financial resources for STI activities with a long-term vision through
8) public and private financing.
9) To address the transformative strengths and weaknesses of the Indian R&D
10) ecosystem in order to create a purposeful and accountable research ecosystem that
11) addresses the socio-economic need of the country and at the same time make the
12) country globally competitive.
13) To accelerate research (including multidisciplinary and interdisciplinary research)and
14) innovation in the HEIs in the country, and make education at all levels more inclusive
15) and connected with the economy and the society. In this regard, STIP fully endorses
16) the new National Education Policy (NEP) 2020, and wishes to ensure synergetic
17) efforts of both policies towards this goal.
18) To enhance capacity development for inculcating and promoting scientific temper
19) across the country's people through equity, gender parity and inclusiveness catering to
20) the diverse needs of the country.
21) To develop scientific literature and media across Indian languages and geographies to
22) maximize the number of people that participate in and contribute to the scientific
23) discussions and processes in the country.

Promoting Science Education in Odisha

A numerous organization are working efficiently for developing science education in the state Odisha of India. Following are among the noteworthy organizations.

State Council on Science and Technology

In order to promote the development of Science and Technology in the State State Council on Science and Technology, Orissa' has been constituted as the highest policy making body in the State pertaining to Science and Technology Sector. Under the scheme, financial support is being provided to carry out application oriented research projects, development/popularization of science and technology programmers, publicity and advertisement in support to various scientific activities and its development, seminars, workshops, conferences etc. some important activities pertaining to various programmers/schemes.

Orissa Bigyan Academy

It has been set up for popularization of Science & Technology in the State. 'Bigyan Diganta', the Monthly Oriya Science Magazine, specially designed for school students and for their parents and other rural people has been continuously published by the Orissa Bigyan Academy since, 1993.

Orissa Bigyan Academy organised the different popular science programme viz. Science Exhibition, Science based essay/ debate/ quiz/ sit and draw competitions, seminars etc. among the school children in collaboration with different Organization/ Institutions of the state.

Pathani Samant Planetarium

Pathani Samanta Planetarium is the Premier Institution of the State. The main objective and function of the Planetarium is to bring to the public the awe and wonders of the universe through the Planetarium shows. It aims at creating awareness on Astronomy, Astrophysics and Space Science among the common mass in general and the young students in particular.

Institute Of Mathematics And Applications (IMA)

This institute has started functioning during 1999-2000 with the following objectives:

- To undertake fundamental research in Mathematics and its Applications.
- To organise reorientation and refresher programmes for teachers/research
- scholars with a view to upgrade their teaching /research skills.
- To organise publication of research monographs / journals/ proceedings/
- papers on Mathematics and its Applications

These institutions are working towards the advancement of science education in Odisha with different approaches but similar objectives, fortifying research being the foremost.

Conclusion

In present time, science depends not only on the endeavor of scientists but primarily on an well-organized ecosystem consisting of high quality schools, colleges and universities which stimulate scientific bent of mind. Scientific innovations have contributed the most to change the civilization. Education without inclusion of science is not possible. Science education is the key to prepare rational and creative minds. The basic principles of science is taught at school level while scientific research is encouraged at higher education level in our system. Many committees and Commissions had conduced to the structuring and restructuring of science education in India. The most recent educational policy i.e NEP,2020 has brought about the concept of evidence-based thinking and competency based learning and assessment to inculcate scientific temper; and emerged as a new hope for 21st-century India.

References

Bagwan, W. A., Gavali, R. S., & Maity, A. (2023). Quantifying soil organic carbon (SOC) density and stock in the Urmodi River watershed of Maharashtra, India: implications for sustainable land management. *Journal of Umm Al-Qura University for Applied Sciences*. https://doi.org/10.1007/s43994-023-00064-3

Basak, S., Chakraborty, S., & Singhal, R. S. (2023). Revisiting Indian traditional foods-A critical review of the engineering properties and process operations. *Food Control*, *143*. https://doi.org/10.1016/j.foodcont.2022.109286

Chakrabarty, S. P., Tanoue, M., & Penteado, A. (2023). The Trouble Is, You Think You Have Time: Traditional Knowledge of Indigenous Peoples in Japan and India, the Reality of Biodiversity Exploitation. *Environmental Management*, *72*(1). https://doi.org/10.1007/s00267-021-01560-0

Economic Survey Report. (2022-23). Chapter 17. Science and Technology.

French, S., & Murphy, A. (2023). The Value of Surprise in Science. *Erkenntnis*, *88*(4). https://doi.org/10.1007/s10670-021-00410-z

Government of India. (1952). Secondary Education Commission Report.

Government of India. (1964-66). Report of Education Commission.

Government of India. (1968). National Policy on Education- 1968. Ministry of Education. New Delhi.

Government of India. (1986). National Policy on Education- 1986 and Programme of Action 1986. Ministry of Human Resource Development. New Delhi.

Government of India. (1992). Report of the CABE Committee on Policy. Ministry of Human Resource Development. New Delhi.

Hoyningen-Huene, P. (2023). Objectivity, value-free science, and inductive risk. *European Journal for Philosophy of Science*, *13*(1). https://doi.org/10.1007/s13194-023-00518-9

Maganga, D. P., & Taifa, I. W. R. (2023). Quality 4.0 conceptualisation: an emerging quality management concept for manufacturing industries. *TQM Journal*, *35*(2). https://doi.org/10.1108/TQM-11-2021-0328

Murphy, A. (2023). Form and Content: A Defense of Aesthetic Value in Science. *Philosophy of Science*, *90*(3). https://doi.org/10.1017/psa.2023.46

National Education Policy (2020), Ministry of Education, Government of India.

Price, L. (2023). Mother Cow and Maternal Behaviour in Colonial North India. *South Asia Research*, *43*(1). https://doi.org/10.1177/02627280221141050

Stojanovic, M. (2023). Pursuitworthiness in urgent research: Lessons on well-ordered science from sustainability science. *Studies in History and Philosophy of Science*, *98*. https://doi.org/10.1016/j.shpsa.2023.01.004