An Analysis of National Education Policy (NEP) 2020 for Transforming Infrastructure Development and Research Excellence in Higher Educational Institutions in India: A Comparative Study

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ABSTRACT:

The National Education Policy (NEP) 2020 is a major step towards improving higher education in India, focusing on better infrastructure and promoting research. This study examines how NEP 2020 changes Higher Education Institutions (HEIs) by encouraging them to build world-class facilities and boost research activities. It highlights key reforms like giving institutions more freedom, creating multidisciplinary Universities, and supporting research through the National Research Foundation (NRF). The study examines how these changes aim to improve the quality of education and research in India. It also explores how HEIs use technology and digital tools to support learning and research. Additionally, the study reviews how the policy encourages global partnerships and addresses gaps in research funding and capacity. Through a mix of legal analysis and data collection, this study evaluates the progress, challenges, and future possibilities of the NEP's impact on higher education in India. The findings show the policy's potential to bring lasting improvements while identifying areas that need more attention for continued growth.

Keywords: Institution, Explore, Policy, Technology

INTRODUCTION:

The National Education Policy (NEP) 2020 marks a significant shift in India's educational landscape, being the first comprehensive education policy introduced in 34 years. Designed to meet the evolving demands of the 21st century, NEP 2020 envisions transformative reforms across all educational levels—from early childhood to higher education—to enhance access, equity, quality, and accountability (Ministry of Education, 2020). While previous policies, such as the National Policy on Education 1986/92, primarily addressed issues of access and equity, NEP 2020 aims to tackle the unfinished agenda of these earlier policies. A key milestone since the last policy was the Right of Children to Free and Compulsory Education Act of 2009, which legally underpinned efforts to achieve universal elementary education.

Rooted in the rich heritage of ancient Indian knowledge, NEP 2020 draws inspiration from the country's legacy of holistic education, exemplified by world-renowned centers like Takshashila and Nalanda. These institutions attracted scholars from diverse backgrounds, producing luminaries such as Aryabhata, Chanakya, and Charaka, whose contributions spanned mathematics, astronomy, medicine, and more. By preserving and enhancing this legacy, NEP 2020 seeks to foster an education system that not only prepares students for global challenges but also advances India's contributions to world knowledge.

Historically, higher education institutions (HEIs) in India have faced challenges such as outdated infrastructure, limited research funding, and inadequate integration of global best practices. NEP 2020 seeks to bridge these gaps by promoting interdisciplinary studies, facilitating academia-industry collaborations, and infrastructure development and research excellence through initiatives like the National Research Foundation (NRF). This policy also envisions a research-driven ecosystem within HEIs, with dedicated research cells focusing on emerging fields such as artificial intelligence, climate change, and health sciences.

In alignment with the strategic roadmap to achieve SDG-9 by emphasizing research, innovation, and infrastructure development in higher education institutions (HEIs), the NEP 2020 places a strong emphasis on fostering a culture of research and innovation in higher education. This research article aims to analyze the implementation of NEP 2020 within Indian HEIs, examining how the policy is shaping infrastructure improvements and contributing to a research-driven academic culture. Through an analytical approach, this study will explore the challenges and opportunities on transforming HEIs into multidisciplinary universities reflect this commitment, addressing the gaps in current learning outcomes and aligning them with the skills needed for the future.

OBJECTIVES:

I. To assess the impact of NEP 2020 on promoting infrastructure and research excellance
II. To analyze the expenditure for Research & Development in HEIs
III. To identify the Government Fundings on Research & Development in HEIs
IV. To assess the impact of NEP 2020 to archive the Sustainable Development Goal - 9 (SDG)

REVIEW OF LITERATURE:

Srivastava and Mehta (2020) in their study on *Education Policy and Innovation in India*, examine how educational policies have historically influenced innovation in Indian HEIs. The authors identify a lack of focus on infrastructure and research in previous policies and contrast this with NEP 2020's forward-looking approach. They argue that by prioritizing infrastructure development and research, NEP 2020 has the potential to position Indian HEIs as global leaders in innovation. Their research highlights the significance of linking academic institutions with industrial and global research partners to facilitate meaningful progress.[1]

Chakrabarti (2021) in his study on *Financing Research and Infrastructure under NEP 2020*, the HEFA has been instrumental in mobilizing resources for infrastructural development and research projects across HEIs in India. Chakrabarti explains how NEP 2020 facilitates the flow of funds to HEIs for research and innovation projects, with an emphasis on creating a self-reliant academic ecosystem.[2]

Gupta and Singh (2022) in their study *Higher Education Transformation through NEP 2020* that while the policy offers promising avenues for infrastructural development and research excellence, there are significant obstacles, including financial constraints, bureaucratic bottlenecks, and varying institutional capacities. Their study emphasizes the need for robust implementation frameworks to ensure the success of NEP 2020.[3]

Patel, V., & Reddy, P. (2023) in their article *Long-Term Impact of NEP 2020 on Research Excellence in India*, examine the potential long-term outcomes of the policy on research and innovation within Indian HEIs. They suggest that NEP 2020 can help create a vibrant research ecosystem in India, provided there is continuous monitoring and evaluation of its implementation across HEIs.[4]

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RESEARCH METHODOLOGY:

The study adopts an analytical research design, utilizing both doctrinal and empirical research methodologies. Data is sourced from government reports, academic studies, and financial reports of higher education institutions. The research relies heavily on secondary sources existing literature and online resources i.e. government report, books, journals, papers, and articles. This analytical study reviews pertinent literature to establish a foundation for the author's understanding and discussion of the subject matter.

RESEARCH & DEVELOPMENT IN ACADEMIC INSTITUTIONS:

Research and Development (R&D) in academic institutions plays a pivotal role in driving innovation, advancing knowledge, and contributing to societal progress. Higher education institutions (HEIs) serve as vital centers for R&D, facilitating the growth of new ideas, technological advancements, and solutions to complex challenges. R & D activities in academic institutions are critical for several reasons:

I. **Knowledge Creation and Innovation:** Academic institutions are essential for generating new knowledge and exploring scientific phenomena. The outcomes of research contribute to the global body of knowledge and form the foundation for further advancements across various fields, including science, technology, social sciences, and humanities.[5] Innovations arising from academic research can lead to new technologies, medical breakthroughs, and improved educational practices.[6]

II. **Economic Growth and Competitiveness:** The economic implications of R&D in academic institutions are significant. Collaborative efforts between universities and industries facilitate the commercialization of research outcomes, driving economic growth and enhancing national competitiveness.[7]

III. **Social Development and Public Policy:** Research conducted in academic institutions informs public policy and addresses pressing societal issues. By producing evidence-based solutions, academic R&D can influence decision-making in areas such as health, education, and environmental sustainability.[8]

IV. **Enhancing Academic Reputation:** Universities that excel in R&D often enhance their academic reputation and ranking globally. Strong research outputs contribute to institutional prestige and attract funding, faculty, and students.[9]

NEP 2020- RESEARCH AND INNOVATIONS FOR TRANSFORMING EDUCATION:

The National Education Policy (NEP) 2020 in India prioritizes research and innovation as core components of a transformative educational framework. It aims to make the existing educational system more inclusive, flexible, and aligned with the needs of a rapidly changing global landscape. The policy promotes interdisciplinary research, establishing research institutions, enhancing research funding, and promoting student entrepreneurship. It also advocates for the active participation of students in research activities, enabling them to engage in hands-on learning experiences and contribute to ongoing research projects. Overall, NEP 2020 seeks to enhance the quality of education, foster critical thinking, and promote holistic development among learners. It proposes the establishment of a National Research Foundation (NRF) to provide grants and support for research projects, fostering a culture of inquiry and innovation.

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GOVERNMENT FUNDING INITIATIVES TO PROMOTE R&D INFRASTRUCTURE IN HEIS:

The advancement of research and development (R&D) infrastructure within higher education institutions (HEIs) in India has become a critical focus for the Indian government. Recognizing that robust R&D capabilities are essential for national development, innovation, and competitiveness in the global arena, the government has launched several initiatives aimed at enhancing the research ecosystem in HEIs.

I. **National Institutional Ranking Framework (NIRF):** The National Institutional Ranking Framework (NIRF) was introduced by the Ministry of Education in 2015 to assess and rank Indian universities and colleges based on various parameters, including research output. NIRF emphasizes the importance of research by including metrics such as publications, citations, and patents in its evaluation criteria. By promoting transparency and competition among institutions, NIRF encourages HEIs to strengthen their research capabilities, thereby enhancing the overall research landscape in the country.[10]

II. **Higher Education Funding Agency (HEFA):** The Higher Education Funding Agency (HEFA) was established in 2018 to facilitate the development of infrastructure in HEIs through innovative funding mechanisms. HEFA provides loans to institutions for constructing research facilities, laboratories, and other essential infrastructure needed to promote research activities. This initiative aims to enhance the overall research capacity of Indian HEIs and support their long-term growth.[11]

III. **Innovation and Entrepreneurship Development Centres (IEDCs):** To cultivate a culture of innovation and entrepreneurship, the Indian government has established Innovation and Entrepreneurship Development Centres (IEDCs) in various HEIs. These centers provide support for research, product development, and technology commercialization. By fostering collaboration between academia and industry, IEDCs enable students and researchers to transform their ideas into viable business ventures, thus contributing to the innovation ecosystem.[12]

IV. **The Science and Technology (S&T) Program:** The Government of India has launched various Science and Technology (S&T) programs aimed at strengthening research infrastructure in HEIs. Programs funded by the Department of Science and Technology (DST) provide grants and financial support for research projects, equipment purchases, and infrastructure development.[13]

V. **National Research Foundation (NRF):** The proposed National Research Foundation (NRF) aims to provide a robust framework for funding and supporting research activities in India. Expected to be established soon, the NRF will enhance the quality and quantity of research output by providing financial support for research projects, promoting interdisciplinary research, and encouraging collaboration among various stakeholders.[14]

VI. **Scheme for Promotion of Academic and Research Collaboration (SPARC):** The Scheme for Promotion of Academic and Research Collaboration (SPARC) is a government initiative designed to enhance collaboration between Indian institutions and leading global institutions. SPARC provides funding for joint research projects, workshops, and faculty exchange programs, facilitating knowledge exchange and strengthening research capabilities in Indian HEIs.[15]

VII. **Skill Development Initiatives:** Recognizing that a skilled workforce is vital for effective R&D, the government has launched skill development initiatives aimed at enhancing the competencies of researchers and students. Programs such as the National Skill Development Mission (NSDM) and the Skill India initiative focus on developing a skilled workforce capable of contributing to research and innovation in HEIs (Government of India, 2020).[16]

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EXPENDITURE ON RESEARCH & DEVELOPMENT

The pie chart below illustrates the distribution of R&D funding in India by sector before the National Education Policy (NEP) 2020. Government funding comprised the largest share at approximately 55%, while private sector contributions were around 36%, and higher education institutions (HEIs) made up about 9% of the total.

Image-1: (R&D Funding distribution in India by sector (before NEP 2020)
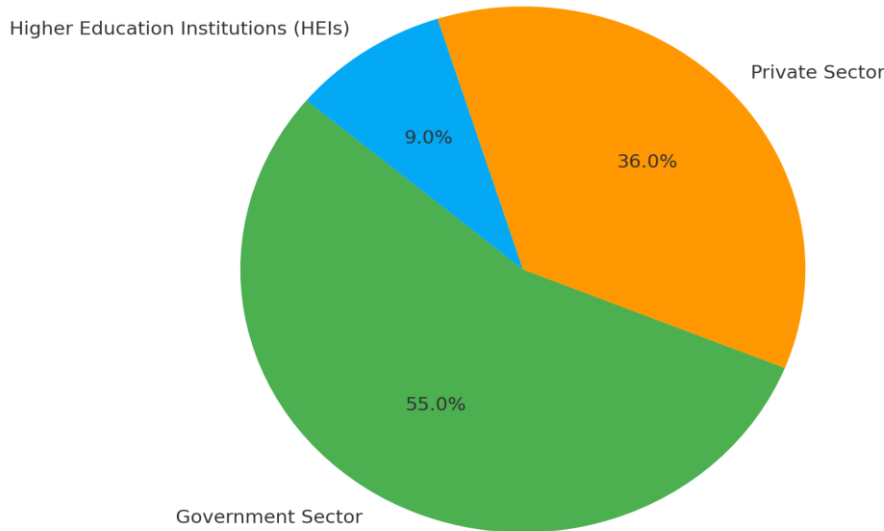
Source: https://www.insightsonindia.com

The pie chart below illustrates the distribution of R&D funding in India by sector after the National Education Policy (NEP) 2020. Government funding comprised the largest share at approximately 23%, while private sector contributions were around 66%, and higher education institutions (HEIs) made up about 11% of the total.
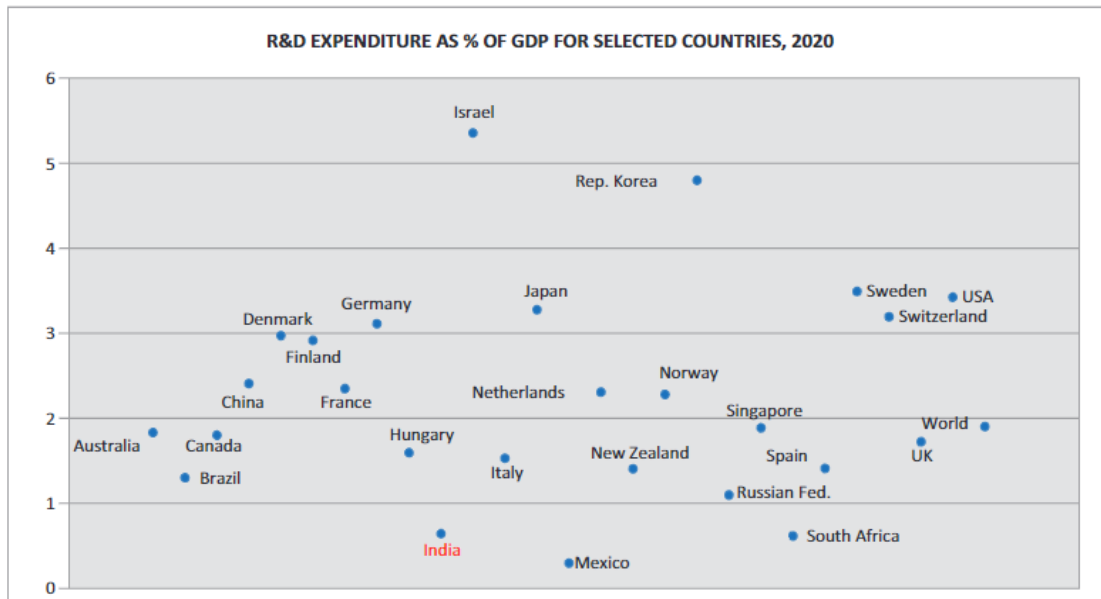
Image-2 (R&D Funding distribution in India by sector (after NEP 2020).
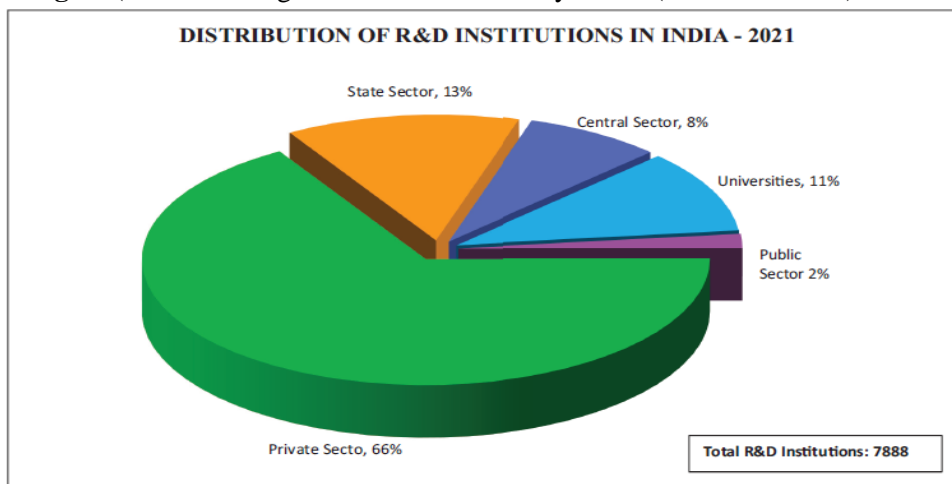
Source: NSTMIS, DST, Government of India

The chart below illustrates the R&D expenditure of GDP for selected countries, 2020.

Image-3: R&D Expenditure as % of GDP for selected countries, 2020

Source: Main Science and Technology Indicators (MSTI), OECD, September 2022, UNESCO Website & India- R&D Statistics, 2022–23

The chart below illustrates that India stands in contrast with select developed and emerging economies with 59% participation in GERD being made by the government including the Higher Education Sector. Participation of the Higher Education Sector in GERD by India is quite low among selected countries. In most of the developed and emerging economies, the participation of Business Enterprises in GERD is generally more than 50%. In fact, it is more than 70% for China, Japan, South Korea, and USA.

Image-4: Participation of Government, Business Enterprise & Higher Education Sector, 2020
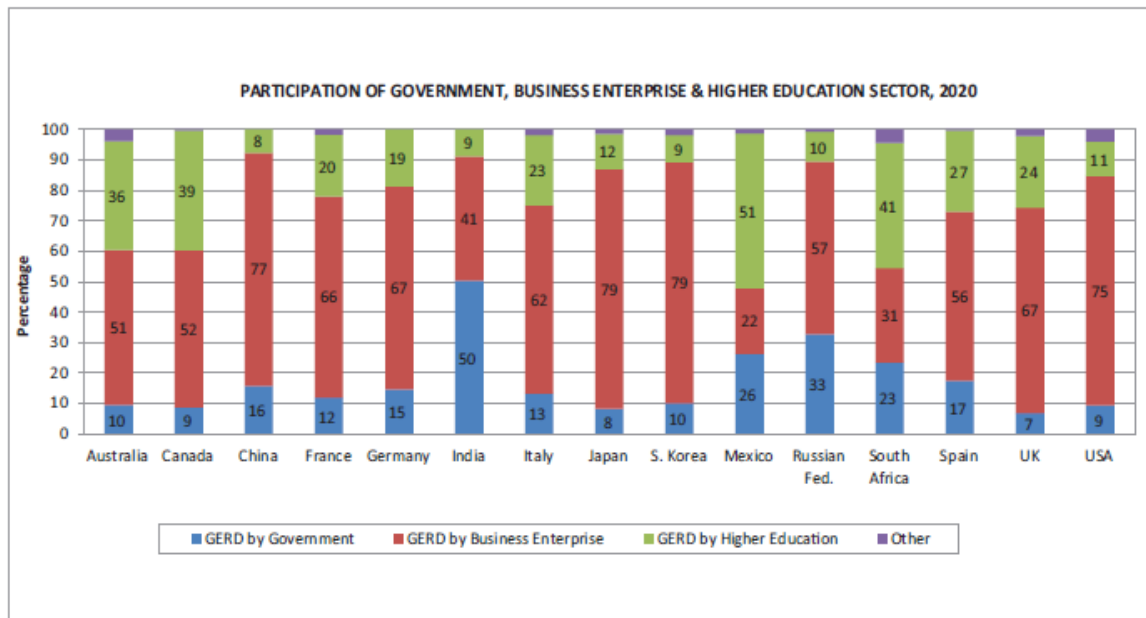
Source: Main Science and Technology Indicators (MSTI), OECD, September 2022 and India-Data collected and compiled by NSTMIS, DST, GoI
Note: Reference year: 2019-Australia, South Africa, and UK

NEP 2020 - A ROADMAP TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS (SDG-9)

NEP 2020 presents a strategic roadmap to achieve SDG-9 by emphasizing research, innovation, and infrastructure development in higher education institutions (HEIs). NEP 2020 places a strong emphasis on fostering a culture of research and innovation in higher education. By establishing the National Research Foundation (NRF), NEP

envisions greater research funding and collaborative efforts between universities and industry.[17] NEP 2020 encourages HEIs to enhance their physical and digital infrastructure to meet international standards. The policy advocates for the establishment of multidisciplinary institutions and the development of state-of-the-art laboratories and research facilities. This aligns with SDG-9's target of improving infrastructure and upgrading industries to be more sustainable, with a focus on quality, reliability, and resilience.[18] To promote sustainable industrialization, NEP 2020 emphasizes the importance of collaboration between academia and industry. It encourages the development of incubators and innovation centers within HEIs, providing students with opportunities to work on real-world problems and contribute to industrial solutions. This initiative directly supports SDG-9 by fostering innovation that can enhance the efficiency and sustainability of industries.[19] The policy also stresses the need for digital transformation in education, which is crucial for achieving SDG-9. The creation of virtual laboratories, online learning platforms, and digital repositories can enable access to education and research resources across India, bridging the gap between urban and rural areas (Verma, 2020).[20]

OVERVIEW AND ANALYTICAL INSIGHTS OF THE CONSULTATIVE EXERCISE

NEP 2020 is a major shift in India's education framework, focusing on higher education, research, innovation, and infrastructure. It aims to address historical challenges faced by HEIs such as outdated infrastructure, underfunded research, and limited global collaboration. The document emphasizes upgrading infrastructure, fostering interdisciplinary studies, and promoting research and innovation through funding mechanisms like the Higher Education Financing Agency (HEFA). R&D is highlighted as essential for advancing knowledge and improving economic competitiveness, with HEIs playing a significant role in generating new ideas and technologies. Government initiatives like NIRF, HEFA, and NRF aim to enhance the research capabilities of HEIs. India's lag in terms of GDP spending on research and development is compared with other BRICS countries and developed nations.

FINDINGS

I. The policy has promoted interdisciplinary learning and collaboration between academia and industry, but global collaborations remain underdeveloped due to a lack of effective internationalization frameworks and limited institutional autonomy.

II. Funding Agencies has played a pivotal role in providing funds to HEIs for infrastructure projects, but institutional inertia, bureaucratic red tape, and insufficient monitoring mechanisms pose challenges to fully realizing the transformative goals.

III. Long-term success will require continued investment, stronger monitoring, and enhanced capacity-building efforts for under-resourced institutions, integration of global best practices, and promoting private sector involvement in R&D funding.

IV. NEP 2020 has significantly improved physical and digital infrastructure in India, but resource distribution and implementation have been uneven across HEIs.

V. The NEP 2020 aligns with SDG-9 by enhancing research, infrastructure, and industry collaboration in HEIs. It emphasizes innovation, sustainable industrialization, digital transformation, and multidisciplinary development.

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CONCLUSION AND RECOMMENDATIONS

The NEP 2020 is a significant milestone in India's higher education landscape, focusing on infrastructure development and research excellence. It has spurred changes in institutional frameworks, governance structures, and funding mechanisms, aimed at fostering research and innovation within higher education institutions. The policy's focus on multidisciplinary research, international collaboration, and robust research infrastructure signifies a shift towards positioning India as a global leader in education and research. However, challenges persist, including uneven implementation of policy reforms, infrastructural gaps in rural and underfunded HEIs, and the need for continuous financial support for research projects. These challenges must be strategically addressed to fully realize the vision of the policy.

Recommendations:

I. The success of NEP 2020 depends on adequate funding for research and infrastructure development. The government should strengthen financial support for research funding agencies and incentivize private sector investments in R&D.

II. HEIs should focus on improving research outputs by offering regular training programs in research methodologies, data analysis, and grant writing.

III. Multidisciplinary research should be streamlined by creating dedicated interdisciplinary research centers.

IV. State-of-the-art digital infrastructure should be built across all HEIs, including expanding high-speed internet access, upgrading research software and tools, and creating digital libraries. Special schemes should be developed to promote research in rural and underfunded HEIs.

V. An independent body should monitor the progress and assess research outputs, infrastructure improvements, and the overall impact of policy reforms.

VI. Collaboration between the public and private sectors can enhance research infrastructure and innovation.

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