



The Role Of NITI Aayog For Promoting Research And Development (R&D) In Higher Education Institutions (Heis)

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Abstract:

Research and Development (R&D) stands as the cornerstone of academic institutions, serving as a catalyst for innovation, knowledge advancement, and societal progress. The National Education Policy (NEP) 2020 is a transformative narrative, not merely a policy document but a catalyst for reshaping India's educational trajectory. The present report aims to improve the R&D culture in India with a focus on State Universities. The report systematically addresses the diverse challenges these institutions face, including funding constraints, teaching-research imbalances, faculty mindset, and administrative hurdles. It provides a nuanced understanding of the current state of research and innovation in State Universities, highlighting both pockets of excellence and systemic impediments. Based on these insights, the report outlines a roadmap for transformative change, offering actionable recommendations such as establishing research and development committees, developing infrastructure, providing faculty incentives, fostering industry partnerships, and encouraging international collaborations.

Keywords: Innovation, University, Challenge, Roadmap, Development, Industry

1. Introduction:

NITI Aayog (National Institution for Transforming India) is the premier policy think tank of the Government of India, established with the aim of fostering cooperative federalism and enhancing the economic policy-making process through a bottom-up approach. It replaced the Planning Commission on January 1, 2015, marking a significant shift in India's approach to development planning. The establishment of NITI Aayog

represented a paradigm shift from centralized planning to a more inclusive and participatory model. The Planning Commission, set up in 1950, followed a top-down approach, often criticized for being rigid and disconnected from the states' needs and realities. NITI Aayog, on the other hand, was designed to ensure greater involvement of state governments in the formulation and implementation of policies, reflecting the federal structure of India. It formulates long-term policies and programs and ensures their effective implementation through regular monitoring and feedback. One of the core objectives of NITI Aayog is to foster cooperative federalism. Encouraging states to participate in the policy-making process actively ensures that policies are tailored to local needs and conditions. This collaborative approach helps in achieving more balanced and inclusive development. This program targets districts that have lagged in key development indicators, aiming to transform them through focused interventions in health, education, infrastructure, and economic development.

2. Objectives:

1. To examine the strategic initiatives and policies implemented by NITI Aayog aimed at enhancing the research capabilities and innovation potential of HEIs.
2. To analyze the funding mechanisms and financial support provided by NITI Aayog to HEIs for research and innovation projects.
3. To measure the impact of NITI Aayog's initiatives on the research output, innovation capacity, and overall academic performance of HEIs.
4. To provide policy recommendations for further strengthening the role of NITI Aayog in supporting research and innovation in higher education based on the findings.

3. Review of Literature:

Verma, S. (2017), In a series of proposals that might lead to improvement in the higher education infrastructure and skill development of individuals in urban regions, the Niti Aayog in its Three Year Action Agenda 2017-18 to 2019-20, released on Thursday, said that the government needs to create 20 world-class universities, provide autonomy for top colleges and universities, reform the regulatory system, establish a system of project-/researcher-specific grants and increase focus on vocational and profession-led education.¹

Economic Times, (2023), "NITI Aayog is preparing a vision document for 2047 and education has a separate role in it. One of the important points in this include that, by 2047, we aim to target half a million foreign students in India. We should become the global provider of education by improving our quality, brand value and improving our rankings which are globally recognized,". Universities will invariably play a huge role in

¹ Article by Verma,S. (2017), "Niti Aayog's Three Year Action Agenda: 'Focus on higher education, greater skills must for raising employability'", Retrieved from <https://indianexpress.com>

developing the right thought process of students. The Indian Universities, and higher educational institutions have a period of 25 years to exploit the potential of India's demographic dividend.²

Education for all in India, (n.d), NITI Aayog recognizes the need for robust infrastructure and effective governance in the education sector. Infrastructure development and construction of schools, colleges, & libraries are the key focus areas. Additionally, NITI Aayog works towards improving the governance structure, promoting transparency, accountability, and efficient management of educational institutions.³

Prasad V.S, (2018), The Three Year Action Agenda 2017-18 to 2019-20, developed by NITI Aayog in April 2017 has this to say: 'We should introduce a system of regulation that focuses on information disclosure and governance rather than micro- management of universities. This requires an overhaul of the UGC as a regulatory system and a rationalisation of the role of professional councils.' The NITI Aayog is also suggesting a tiered system of Universities with a graded system of regulation. The OUs need to strengthen their systems of self-regulation through disclosures, declarations and reports and prepare themselves to be part of the proposed graded system of regulations.⁴

Observer Research Foundation, (2019), In December last year (2019), the NITI Aayog, in collaboration with the United Nations (UN), released the Baseline Report of the SDG India Index, which ranks and documents progress of Indian States and Union Territories in implementing 2030 SDG goals. In the report, Yuri Afanasiev, resident coordinator of the UN, stressed on the fact that India's progress on SDGs in the next decade is "critical" to the world because of its population size as well as her "extraordinary economic growth". In view of this, India needs to deliberate on strategic ways of achieving success in the implementation of SDG.⁵

The NITI Aayog undertook a systematic approach, organizing a structured sequence of meetings with Vice Chancellors, Heads, and other Senior Representatives from universities and institutes spanning the length and breadth of India. These consultations were strategically divided based on geographical regions, including the National Capital Region of Delhi, the northern, eastern, northeastern, and southern, and universities in the western and central regions. This comprehensive outreach covered a spectrum of stakeholders, totaling over 110 universities and institutes from all 36 states and Union Territories of India.⁶

² Article by Economic Times, (2023), "*India targeting enrolment of half million foreign students by 2047, says Niti Aayog CEO*" Retrieved from <https://economictimes.indiatimes.com>

³ Article by Education for all in India, (n.d), "*Strengthening Education Infrastructure & Governance*" Retrieved from <https://educationforallinindia.com/niti-aayogs-for-revolutionizing-education-2023/>

⁴ Prasad V,S, (2018), "*Higher Education and Open Distance Learning Trajectory in India: Reflections of an Insider*" Dr.BRAOU, pp. 80

⁵ Article by Observer Research Foundation, (2019), "*SDG rankings: Lessons for Indian higher education institutes*", Retrieved from <https://www.orfonline.org/expert-speak/sdg-rankings-lessons-for-indian-higher-education-institutes-49917>

⁶ A report published by Saraswat V., K. Mehra S., Sinha N., (2022), *Improving the Culture of Research and Development (R&D) in State Universities and Institutes*, pp. 1

4. Research Methodology:

Drawing from the documents at hand, the paper seeks to explore and scrutinize the major shifts in structure, challenges in infrastructure, and issues related to promoting research and development in higher educational institution as a result of Niti Aayog; naturally, the primary data comes from secondary sources. Additionally, the research is analytical, with a focus on reviewing pertinent literature to form the foundation of the author's comprehension and discussions on the subject matter. A significant amount of essential information, data, and descriptions have been gathered from online sources. Generally, the paper's final conclusion showcases the author's analytical abilities, aiming to benefit all stakeholders interested in Niti Aayog and to help them grasp the policy in a comprehensive way.

5. Importance of Research & Development in Academic Institutions:

Research and Development (R&D) stands as the cornerstone of academic institutions, serving as a catalyst for innovation, knowledge advancement, and societal progress. In the dynamic landscape of education, R&D plays a pivotal role in shaping the future by fostering a culture of inquiry, experimentation, and discovery. Academic institutions, particularly State Universities and Institutes, are crucial contributors to the national research ecosystem, possessing the potential to drive groundbreaking discoveries, technological innovations, and solutions to press challenges.⁷

The significance of R&D in academic institutions extends beyond the confines of traditional education. It propels institutions to the forefront of global competitiveness, positioning them as hubs for cutting-edge research, interdisciplinary collaboration, and intellectual contributions. As the world undergoes rapid transformations, the role of academic R&D becomes increasingly crucial in preparing students for the demands of a knowledge-driven society.

6. Research & Development Landscapes in the Global Arena:

- I. Germany constantly invests around 3% of its Gross Domestic Product (GDP) in research and development, positioning the country among the top global spenders in R&D relative to GDP.⁸
- II. Japan consistently directs a significant portion of its GDP, typically around 3.5%, towards research and development, showcasing a consistent commitment to fostering innovation and technological progress.⁹
- III. Singapore directs a significant portion of its GDP, exceeding 2% in recent years, towards R&D investments, showcasing a commitment to fostering innovation and technological advancement.¹⁰
- IV. India's Gross Domestic Expenditure (GDP) 0.64% is a critical indicator of the country's commitment to fostering innovation, scientific research, and technological advancement. GDP encompasses the total

⁷ Supra note 7, p.3

⁸ Ibid. p.4

⁹ Ibid. p.5

¹⁰ Ibid. p.7

expenditure on R&D performed by various sectors including government, private industries, academic institutions, and non-profit organizations within the country.

7. Revolutionizing Indian Education through the National Education Policy 2020:

I. Rethinking Higher Education:

The National Education Policy (NEP) 2020 unfolds as a transformative narrative, not merely as a policy document but as a catalyst for reshaping India's educational trajectory. In its essence, NEP 2020 represents a paradigm shift, steering the nation towards a future where the synergy between education and research becomes the cornerstone of progress.¹¹

NEP 2020 initiates a profound reevaluation of higher education, challenging conventional norms and fostering an ecosystem where innovation is not an exception but an expectation. The 'Institutions of Eminence' initiative, a manifestation of this vision, seeks not just excellence but a redefinition of what excellence means in the context of research and innovation.¹²

Beyond the rhetoric, NEP 2020 breathes life into the commitment to bolstering research and development (R&D). This is not a mere quantitative surge but a qualitative leap, focusing on scientific research and the tangible impact of technology development. The crux lies in the acknowledgment that outstanding education cannot exist without a parallel commitment to groundbreaking research – a symbiotic relationship at the core of NEP 2020.¹³

II. Gross Domestic Expenditure on R&D, as % of GDP:

The Gross Expenditure on Research and Development (GERD) in India has exhibited a consistent upward trajectory, witnessing a notable surge from Rs. 60,196.75 crore in 2010-11 to Rs. 127,380.96 crore in 2020-21. This substantial increase reflects a more than twofold growth over the specified timeframe, underscoring the nation's intensified commitment to fostering research and innovation.¹⁴

According to the UNESCO Science Report 2021, India's global standing in GERD is noteworthy, constituting 3.1% of the World's Gross Expenditure on Research and Development in 2018. This recognition on the global stage signifies India's growing significance in contributing to the collective pool of scientific and innovative endeavours. The escalating GERD figures and international acknowledgment underscore India's dedication to advancing research across diverse domains, positioning itself as a key player in the global scientific landscape.¹⁵

Figure 2: National R&D Expenditure and its Percentage with GDP

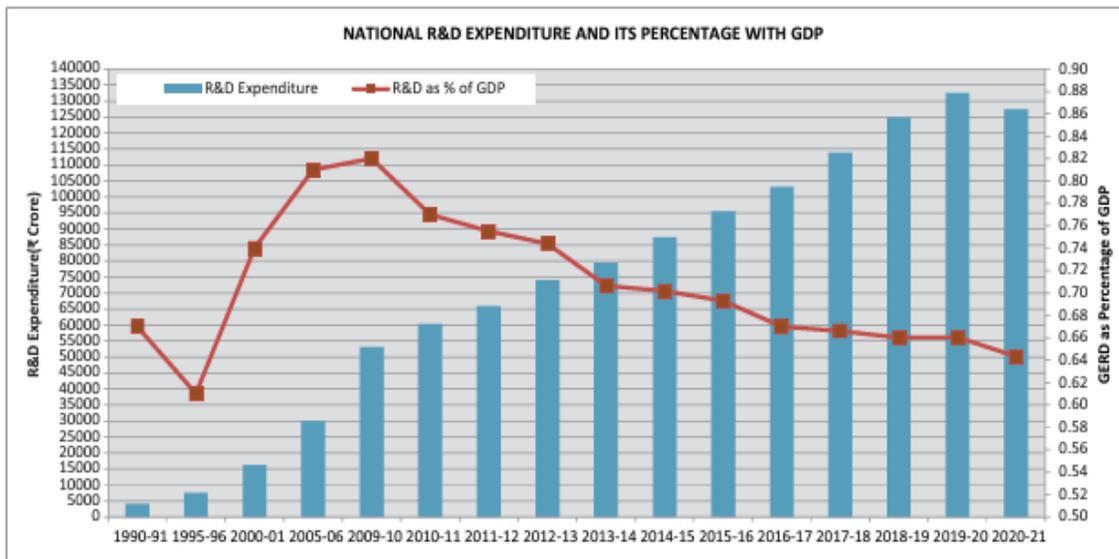
¹¹ Ibid. p.11

¹² Id.

¹³ Id.

¹⁴ Id.

¹⁵ Id.



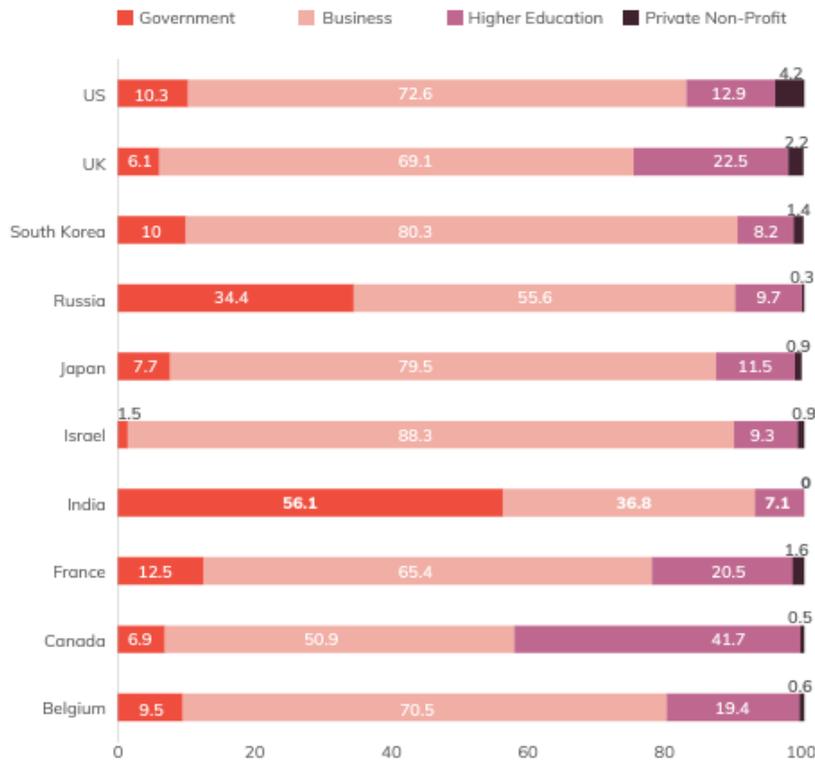
Source: NSTMIS, Department of Science & Technology, Government of India

8. Gross Domestic Expenditure on R&D, Composition by Sector:

The Science, Technology, and Innovation Policy (STIP) 2013 outlined an ambitious goal, setting the Gross Expenditure on Research and Development (GERD) target for India at 2%. However, despite witnessing annual increments in research and development expenditure, India’s GERD as a percentage of GDP hovers around 0.7%, significantly below the stipulated target.

A key factor contributing to this shortfall is the sectoral composition of GERD, revealing that the Government emerges as the primary contributor to R&D activities in India. To bridge the gap and achieve the targeted GERD, there is a critical need to augment private-sector investments in research and development. This strategic shift is essential for aligning India’s research and development landscape with its aspirations outlined in the STIP 2013, fostering a more balanced and robust ecosystem that propels innovation and scientific advancement.

Figure 3: Sectoral Composition of Spending on R&D



Source: Research and Development Statistics, Department of Science and Technology (DST), Gov.

This module would also increase the share of the higher education sector’s R&D. To achieve this inflexion point, India also has a conducive environment where we see that the number of universities has been increasing over the years and has reached four digits with CAGR being about 5.3% over the last decade.

Figure 4: Number of Universities in India



Source: Higher Education Profiles, AISHE, Ministry of Education, Gov.

9. Overview and Analytical Insights of the Consultative Exercise:

Considering the scope of the present report, which is to improve the R&D culture in India with a focus on State Universities, the consultative exercise sought to take a closer look at research-oriented programmes – typically graduate and doctoral programmes. Hence, the consultative exercise was structured as a series of five meetings,

with each covering different States and Union Territories (UTs) of India, and in two parts – a survey on the status of R&D activities to be completed before the meeting and a consultative discussion in the meeting.¹⁶ There are 1043 Universities in India (as of March 2022), classified as Central Universities, State Public Universities, State Private Universities and Other Institutions, whose distribution is given in Figure 1(a).¹⁷

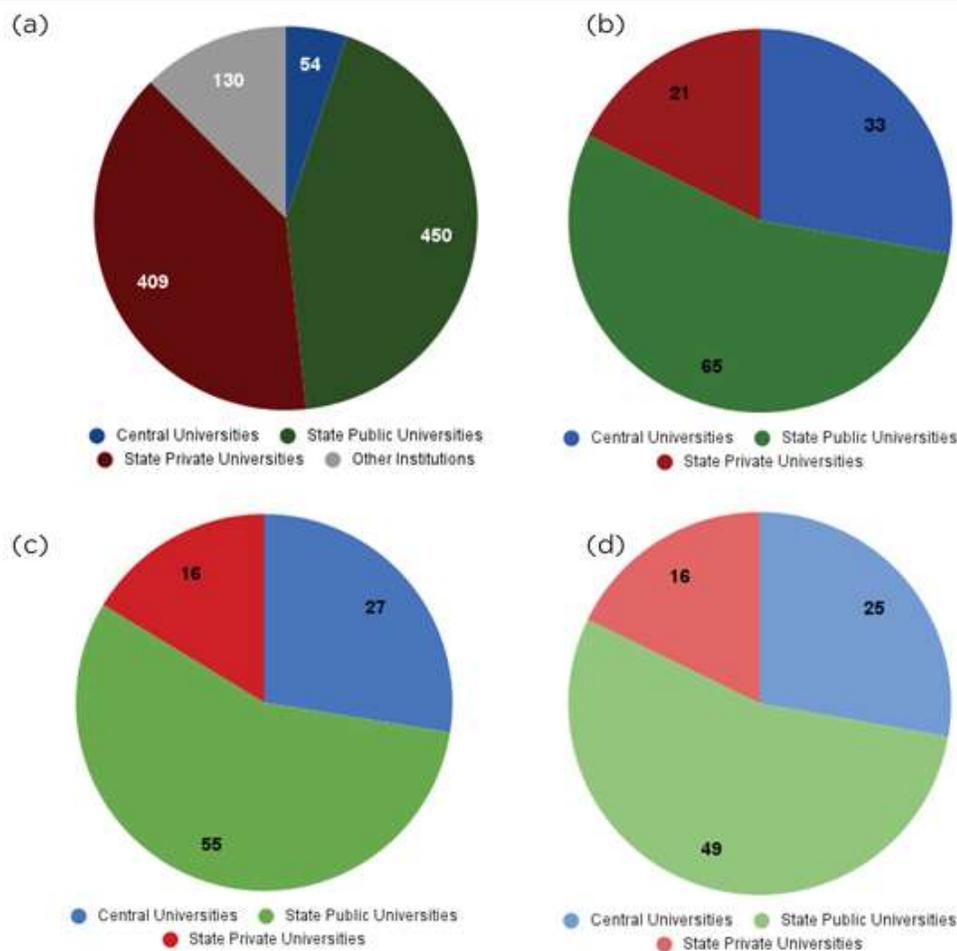


Figure 1: Distribution of Universities (a) in India (b) invited to the meetings (c) attended the meetings and (d) responded to the survey on the Status of R&D activities.

In an attempt to cover at least 10% of these, and considering the focus on State Universities, an invitation for the consultative exercise was sent to 119 Universities with a distribution given in Figure 1(b). Among those, 98 Universities attended the consultative meetings, with distribution as given in Figure 1(c), and 90 Universities responded to the survey on Status of R&D activities, with their distribution given in Figure 1(d).¹⁸

10. Findings:

(The NITI Aayog’s Role in Achieving Social Development Goals)

The Sustainable Development Goals lay out a uniquely ambitious and comprehensive agenda for global development by 2030. NITI Aayog is the nodal institution for achieving SDGs in the country, leading the 2030 Agenda with the spirit of cooperative and competitive federalism.

¹⁶ Ibid. p.15

¹⁷ Id.

¹⁸ Ibid. p.16

It monitors the national and sub-national level's progress through various mechanisms like the SDG India Index and Dashboard, Multidimensional Poverty Index: Progress Review 2023, North Eastern Region Index and Dashboard, and the like. Localization of the SDGs is the key to reach the furthest behind first, and therefore a crucial mandate of the vertical. These efforts have strengthened the statistical systems and developed a monitoring framework covering all 17 Goals and more than 100 indicators across the country. With this refined and comprehensive edition, we aim to cement India's place as a trailblazer in SDG achievement.¹⁹

There are some major challenges faced by State Universities/Institutes as mentioned below:

- I. **Insufficient Funding and Resources:** The persistent challenge of insufficient funding and resources poses a formidable barrier to the robust development of research initiatives within State Universities and Institutes. This overarching issue manifests in multifaceted ways, each presenting a unique set of obstacles to the institution's pursuit of academic and research excellence. At the forefront of this challenge is the limitation it imposes on acquiring cutting-edge equipment. The Universities and Institutes, grappling with financial constraints, find themselves hampered in their ability to invest in state-of-the-art research tools and technologies. This impediment, in turn, directly affects the quality and depth of research outcomes, limiting the institutions' competitiveness on a national and global scale.
- II. **Teaching-Research Imbalance:** The challenge of teaching-research imbalance within State Universities and Institutes underscores a systemic issue that impacts the overall academic landscape. This imbalance, characterized by a disproportionate emphasis on teaching over research activities, engenders a host of challenges that permeate the core functions of these institutions.
- III. **Faculty Mindset and Quality:** The challenge of faculty mindset and quality in State Universities and Institutes is multifaceted, reflecting the complexities inherent in fostering a research-oriented culture. One of the central issues is the divergence in priorities among faculty members, where some may prioritize teaching responsibilities or administrative duties over active engagement in substantive research activities.

Moreover, the quality of research output is intricately linked to the mindset of faculty members. A culture that prioritizes teaching or administrative tasks at the expense of research can impact the depth and rigor of scholarly contributions. To address this challenge, targeted interventions are necessary, including professional development programmes, mentorship initiatives, and institutional policies that incentivize and recognize high-quality research outputs.

¹⁹ Niti Aayog, (n.d.), an overview of SDG's, <https://www.niti.gov.in/overview-sustainable-development-goals>

- IV. **Administrative Processes:** One aspect of this challenge is the time-consuming nature of obtaining approvals and permissions for research projects. The complex layers of administrative clearance, ranging from project proposals to budgetary allocations, can introduce significant bottlenecks. Researchers may find themselves entangled in red tape, diverting valuable time and energy away from the actual research process. Delays in financial approvals, procurement processes, and disbursement mechanisms can hinder the timely execution of research activities.
- V. **Interdisciplinary Collaboration:** Institutional barriers often manifest in rigid departmental structures and administrative silos that discourage interdisciplinary interaction. Faculty members may find it challenging to navigate bureaucratic processes and obtain approvals for cross-disciplinary collaborations, leading to a compartmentalized research environment. Institutional barriers often manifest in rigid departmental structures and administrative silos that discourage interdisciplinary interaction. Faculty members may find it challenging to navigate bureaucratic processes and obtain approvals for cross-disciplinary collaborations, leading to a compartmentalized research environment.
- VI. **Publication Prioritization Over Substantial Research:** The challenge of prioritizing paper publications over substantive research underscores a complex dynamic influencing faculty member. This phenomenon often manifests as a result of external pressures and institutional expectations that place a premium on the quantity of publications rather than the depth and impact of the research.
- VII. NEP 2020 does not confine research to laboratories; it envisions a dynamic landscape where ideas traverse from incubation to real-world impact. The establishment of incubation centers is not a procedural checkbox; it's a strategic move to weave a seamless fabric between academia and industry. The call for interdisciplinary research is not a token gesture; it's a recognition that real-world challenges demand holistic solutions born from the convergence of diverse fields.
- VIII. **Grant Proposal Expertise:** The faculty lacks experience and training in crafting effective research grant proposals, causing delays in project approvals. There is a need to introduce institute specialized training programmes to enhance faculty skills in grant proposal writing.

11. Conclusion and Recommendations:

In conclusion, this comprehensive report encapsulates the multifaceted challenges and thoughtfully crafted recommendations for fostering a vibrant R&D culture within higher educational institutions. The overarching aim is to propel India into a position of global leadership in innovation and technological advancement. The report systematically addresses the diverse challenges these institutions face, including funding constraints, teaching-research imbalances, faculty mindset, and administrative hurdles. It provides a nuanced understanding of the current state of R&D in higher educational institutions, highlighting both pockets of excellence and systemic impediments.

Building on these insights, the report outlines a roadmap for transformative change, offering actionable recommendations such as establishing R&D committees, developing infrastructure, providing faculty incentives, fostering industry partnerships, and encouraging international collaborations. Each recommendation is crafted with practicality in mind, considering implementation feasibility and potential impact.

- I. **Government Funding and Resource Allocation:** Offer competitive remuneration packages to attract top-tier researchers. Provide substantial research grants and fellowship opportunities to support ongoing projects. Invest in continuous professional development programs for researchers to keep their skills and knowledge updated.
- II. **Foster a Culture of Research and Innovation:** Implement reward systems for outstanding research and innovation, including awards, bonuses, and recognition. Create platforms for researchers to collaborate, share ideas, and work on interdisciplinary projects. Develop institutional policies that prioritize and support research activities, including sabbaticals and reduced teaching loads for active researchers.
- III. **Strengthen Industry-Academia Linkages:** Promote internships and joint research projects between students, faculty, and industry partners. Establish offices dedicated to facilitating the transfer of university-developed technologies to the marketplace. Create advisory boards with members from industry to provide insights and guidance on research directions and priorities.
- IV. **Encourage International Collaboration:** Form partnerships with international universities and research institutions for joint research projects and exchanges. Host and participate in international conferences to showcase research and collaborate with global peers. Seek funding opportunities from international organizations and foundations to support collaborative research.
- V. **Leverage Technology and Innovation:** Utilize digital platforms for research management, data sharing, and collaboration. Incorporate AI and data analytics tools to enhance research capabilities and outcomes. Establish innovation hubs and business incubators within universities to support startups and commercialization of research.
- VI. **Engage Students in Research:** Create opportunities for undergraduate students to participate in research projects. Develop mentorship programs where experienced researchers guide students through research processes. Organize research competitions and hackathons to stimulate interest and innovation among students.
- VII. **Alignment of Curricula with Research Goals:** Urgent restructuring of academic curricula to align with NEP's emphasis on research-driven education. Inculcating a research-oriented mindset early in academic pursuits can significantly bolster the R&D culture.

- VIII. **Autonomy for External Ph.D. Registrations:** In a dynamic academic landscape, the proposal to allow external Ph.D. registrations stands as a strategic move towards fostering a balanced teacher-student ratio and promoting a more inclusive research environment.
- IX. **Exempting from GST and Income Tax:** State universities often operate on limited budgets allocated by state governments. Exempting them from GST ensures that essential goods and services they procure for academic and research purposes are not subjected to additional tax burdens. This financial relief allows universities to allocate resources more efficiently to core activities like teaching, research, and infrastructure development.

The urgency of the above recommendations is underscored by their collective potential to position India as a global hub of innovation. This conclusion is more than a summary; it is a compelling plea for the Government of India to recognize and act on the transformative power of these recommendations. It calls for strategic planning and policy formulation aligned with the goal of positioning India at the forefront of groundbreaking research and technological advancements. Thus, the report serves as a clarion call for concerted efforts and visionary actions to shape the future trajectory of R&D in Indian higher education.

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