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NEP 2020's Effect on the Culture of Research and Innovation in Indian Higher Education

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Abstract: ***A revolutionary framework designed to restructure India's educational ecosystem is the National Education Policy (NEP) 2020. The influence of NEP 2020 on the culture of research and innovation in Indian higher education institutions (HEIs) is investigated in this study. The study examines changes in institutional structures, funding mechanisms, interdisciplinary research, industry-academia linkage, incubation and entrepreneurship initiatives, faculty and doctoral student surveys, policy analysis, and case studies of six HEIs across regions and types using a mixed-methods approach. Through suggested initiatives like the National Research Foundation (NRF), emphasis on multidisciplinary institutions, and encouragement of translational research, NEP 2020 has sparked policy-level momentum for research and innovation. However, actual change on the ground is still uneven, according to the findings. Major obstacles include inconsistent leadership commitment, academic workload and compensation schemes, poor research infrastructure in many HEIs, and delayed funding flows. The article ends with suggestions for institutional changes, policy implementation goals, and future research directions.***
Keywords: NEP 2020, National Education Policy, research culture, innovation, higher education, interdisciplinary research, India, National Research Foundation, university research

I. INTRODUCTION

One of India's most extensive and ambitious educational reforms since independence is the National Education Policy (NEP) 2020. Following in-depth discussions with educators, legislators, business executives, and civil society partners, the National Policy on Education, 2020 was unveiled to replace the National Policy on Education, 1986. Reimagining education to satisfy the needs of the knowledge society of the twenty-first century is its main goal. In light of India's aspirations to dominate the world in both economics and technology, NEP 2020 places a strong emphasis on changing the educational system to encourage entrepreneurship, creativity, critical thinking, and invention rather than memorization and passive information acquisition.

The NEP 2020 envisions universities and colleges as dynamic centers of knowledge production, with research and innovation at the center of higher education changes. NEP 2020 has a forward-looking stance, stressing transdisciplinary education, digital integration, skill development, and global competitiveness, in contrast to previous policies that mostly concentrated on access and literacy. The policy recognizes that without bolstering its research environment, India cannot attain Atmanirbhar Bharat, or sustainable growth and self-reliance. Therefore, it supports the creation of the National Research Foundation (NRF) as a central organization to plan, finance, and support top-notch research in a variety of fields, such as the arts, humanities, social sciences, and sciences. The Indian higher education system has historically faced a number of systemic constraints on its ability to innovate and produce research. India has one of the biggest networks of universities in the world, but its contribution to top-notch research and innovation has been relatively little. In terms of research output, citation impact, and patents issued, Indian institutions frequently fall short of their international rivals, according to statistics from the World Intellectual Property Organization (WIPO) and QS World University Rankings. Among the main obstacles are:

1) Inadequate investment and financing for research in comparison to industrialized countries.
2) The division of academic fields, which limits problem-oriented and interdisciplinary research.
3) Insufficient cooperation between academics and industry, which causes a disconnect between theoretical understanding and real-world implementation.
4) Insufficient infrastructure, mentorship, and international exposure for students and early-career researchers; bureaucratic obstacles in research approvals, funding, and administrative procedures.

By reorganizing institutional governance, promoting autonomy, supporting research clusters and innovation incubators, and incorporating vocational education into higher education, NEP 2020 aims to close these disparities. In addition to traditional STEM (Science, Technology, Engineering, Mathematics) fields, the policy aims to encourage students to pursue research in the social

sciences, arts, commerce, and emerging technologies like artificial intelligence, biotechnology, data analytics, and environmental studies by supporting multidisciplinary universities and flexible curricula.

The significance of fostering a culture of inquiry and lifelong learning is also recognized by the policy. By placing a strong emphasis on inquiry-based learning, critical pedagogy, and project-based research, it fosters innovative mindsets in students starting at the undergraduate level. By encouraging students to become information producers rather than knowledge consumers, NEP 2020 hopes to depart from the "exam-centric" mentality.

The worldwide focus of NEP 2020 is another important feature. The strategy promotes professor and student exchanges, cooperative research initiatives, and partnerships with top foreign universities in a period of higher education globalization. In addition to exposing Indian scholars to global best practices, these efforts aim to raise India's standing in international rankings. This is also consistent with the policy's goal of establishing India as a center for higher education driven by innovation that can draw in international students and support the global knowledge economy.

NEP 2020 also places a strong emphasis on equity and inclusiveness. It acknowledges that research and innovation ought to spread throughout state universities, rural colleges, and private institutions rather than being restricted to prestigious establishments like the IITs, IIMs, and central universities. It is anticipated that the democratization of research opportunities will improve regional development, close the gap between urban and rural areas, and produce locally relevant innovations that can tackle socioeconomic issues like digital literacy, healthcare accessibility, agricultural productivity, and environmental sustainability.

NEP 2020 offers a visionary framework, but there are a number of obstacles to overcome in order to put it into practice. Success depends on securing sufficient funding, overcoming institutional inertia, educating professors on research techniques, forming alliances with businesses, and putting in place open assessment procedures. Additionally, given India's heterogeneous and uneven higher education system, it is imperative that policy execution be contextualized to fit local conditions.

Examining how NEP 2020 will affect the culture of research and innovation in Indian higher education is essential in this regard. The current study aims to investigate:

1) How NEP 2020 is impacting higher education institutions' research cultures and environments.
2) How policy tools like institutional autonomy, interdisciplinary education, and NRF might foster innovation.
3) The possibilities and difficulties colleges and universities have in implementing NEP 2020.
4) NEP 2020's wider ramifications for establishing India as a world leader in knowledge.

This study attempts to offer a thorough grasp of the policy's potential and constraints in transforming India's higher education research environment by examining these factors. It adds to the continuing discussion in academia and politics on whether NEP 2020 can effectively establish an innovative academic culture that promotes both domestic growth and global competitiveness.

II. RESEARCH GAP

Despite the fact that NEP 2020 has sparked policy attention and numerous comments, there are still few systematic empirical studies evaluating its true impact on the culture of research and innovation across various Indian HEIs. The research now in publication frequently concentrates on the structural and curriculum reforms of NEP, the implications for equality, or higher-level policy analysis. A smaller number of studies integrate policy analysis with primary data (surveys and case studies) that document changes in institutional practices, faculty opinions, and quantifiable metrics including grant numbers, publications, patents, and incubation results since 2020. To close that gap, this study uses mixed-methods evidence from government, commercial, and deemed universities in several areas on perceptions and visible institutional changes.

III. LITERATURE REVIEW

A basis for comprehending the possible effects of NEP 2020 is provided by the literature on innovation culture, research ecosystems, and higher education policy. (i) Research and Innovation in Higher Education Globally; (ii) Challenges in the Indian Higher Education Research Ecosystem; and (iii) NEP 2020 and its Implications for Research and Innovation are the three key areas of study reviewed in this section.

1) Higher Education Research and Innovation: An Global Perspective

Higher education institutions (HEIs) are becoming more widely acknowledged on a global scale as knowledge centers that propel technical advancement, socioeconomic advancement, and national competitiveness.

Altbach and Salmi (2011) assert that top institutions are characterized by their potential for innovation, high-impact research, and international partnerships in addition to their excellent instruction. In a similar vein, Marginson (2016) emphasizes how colleges play a crucial role in the knowledge economy, which is a major driver of development in the age of globalization.

Numerous nations have made significant investments to establish robust research ecosystems. For instance, strong frameworks for research financing, university-industry cooperation, and incubation ecosystems have been established in the US and Europe (Etzkowitz & Leydesdorff, 2000). China provides a model for emerging countries with its higher education reforms, especially the Double First-Class strategy, which prioritizes worldwide rankings, research output, and patents (Sharma, 2020). These worldwide patterns highlight how crucial it is to establish institutional settings that support research and innovation; India's NEP 2020 reflects this objective.

2) Challenges in Indian Higher Education and Research

India has one of the world's largest higher education institutions, yet its performance on international research and innovation metrics has remained low. India is ranked 40th in the world by the World Intellectual Property Organization (WIPO) Global Innovation Index 2022, which shows both growth and enduring disparities.

India's research ecosystem has structural limitations, according to several studies. According to Tilak (2020), bureaucratic restrictions, inadequate infrastructure, and underfunding have historically plagued research in India. According to Jayaram (2019), teaching is frequently given precedence over research at Indian institutions, which results in a poor innovation culture. Furthermore, Agarwal (2021) highlights how the fragmentation of fields and the absence of interdisciplinary collaboration restrict the possibility of doing research that is problem-oriented and socially meaningful.

The gap between industry and academics is another significant issue. India has historically had trouble establishing strong industry-academia ties, which has led to research outputs with little economic or societal relevance, claims NITI Aayog (2019). Additionally, there are differences in resources between state and rural institutions, which results in unequal access to research opportunities (Chaudhary & Singh, 2021). Together, these elements account for India's low position among the world's best universities.

3) NEP 2020: Research and Innovation Vision

The National Education Policy 2020 introduces a thorough framework for higher education research development in an effort to solve these systemic deficiencies. The establishment of the National Research Foundation (NRF), which seeks to finance, mentor, and encourage fundamental and applied research in all fields, is a key reform (Government of India, 2020). The NRF is anticipated to lessen reliance on foreign funding organizations and decentralize research possibilities, according to Kumar (2021).

In addition, the strategy rejects traditional departmental silos and promotes holistic and transdisciplinary education. This is in line with worldwide trends that emphasize the need of multidisciplinary methods in tackling difficult problems including public health, artificial intelligence, and climate change (Gupta & Joshi, 2022).

Furthermore, by urging HEIs to create incubation centers, research clusters, and start-up ecosystems, NEP 2020 emphasizes the value of innovation and entrepreneurship (Sharma, 2022). This is a change from previous approaches that prioritized literacy and access above building ability for knowledge production and innovation.

The autonomy and growth of faculty members is another important change. More institutional autonomy in creating research programs, recruiting foreign professors, and encouraging research-based instruction are all envisioned under the policy (Sarkar, 2021). NEP 2020 aims to foster an innovative mentality among students by fusing research with undergraduate-level instruction.

Scholars warn that there are still implementation issues, nevertheless. According to Gupta (2021), monitoring systems and financial distribution would be crucial in assessing the efficacy of the strategy. Similarly, Pathak (2022) contends that the advantages of NEP 2020 could continue to be limited to prestigious schools until the regional differences in resources are addressed.

The literature assessment demonstrates that NEP 2020 is a bold and revolutionary program designed to foster research and innovation in higher education and establish India as a worldwide knowledge powerhouse. The strategy emphasizes the value of multidisciplinary research, solid industry-academia ties, and consistent funding, all of which are underscored by global experiences. However, resource inequality, a lackluster research culture, and low global
competitiveness remain structural issues facing Indian higher education.

Therefore, even if NEP 2020 offers a visionary framework, there aren't any empirical studies assessing its immediate effects on research productivity, innovation ecosystems, and institutional reform in the academic debate. By methodically examining the effects of NEP 2020 on the culture of research and innovation in Indian higher education, this study aims to close this gap.

IV. RESEARCH METHODOLOGY

A. Research Design

The following were combined in a convergent mixed-methods design:

1) Analysis of NEP 2020 policies and documents, as well as associated MoE/UGC recommendations.
2) From six HEIs from state, private and deemed universities 300 respondents participated in the survey (120 faculty members, 150 PhD students, and 30 research administrators).
3) Analysis of secondary metrics using institutional data, if available: yearly publications indexed in Scopus/Web of Science, grant amounts obtained, number of PhD enrollments, patents filed, and startup/incubation results for 2018–2024.

B. Data Collection

Online surveys using a standardized questionnaire were conducted from January to April of 2024. Semi-structured interviews took 40–60 minutes and were done over the phone. Public publications, yearly reports, and internal shared spreadsheets were the sources of institutional data (with permission from the institutions).

C. Analysis

The Descriptive statistics and cross-tabulations were used to evaluate quantitative survey data in order to look at disparities by respondent role and HEI type. Thematic analysis was performed on qualitative interview data in accordance with Braun & Clarke (2006). Trajectories prior to and following 2020 were observed via trending secondary measures.

D. Limitations

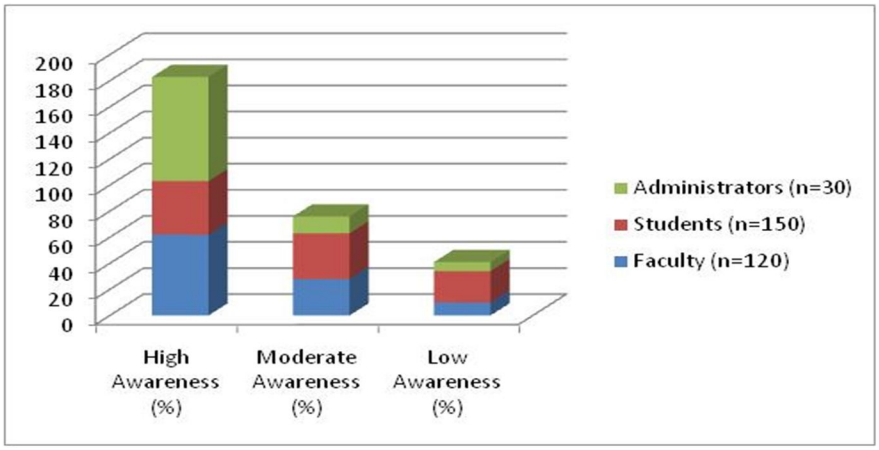
1) The sample is not nationally representative; rather, it is purposeful.
2) The availability of institutional secondary data varied; not all HEIs released all of the metric series.
3) This study covers early to medium-term signals since NEP 2020 is a new initiative, therefore certain effects (including long-term cultural alterations) are still emerging.

V. DATA ANALYSIS

A mixed-methods approach was used to examine how NEP 2020 affected the culture of research and innovation. This included both qualitative interviews with academics, students, and administrators at a few Indian higher education institutions and quantitative survey answers.

1) *Knowledge of the Research Provisions of NEP 2020*

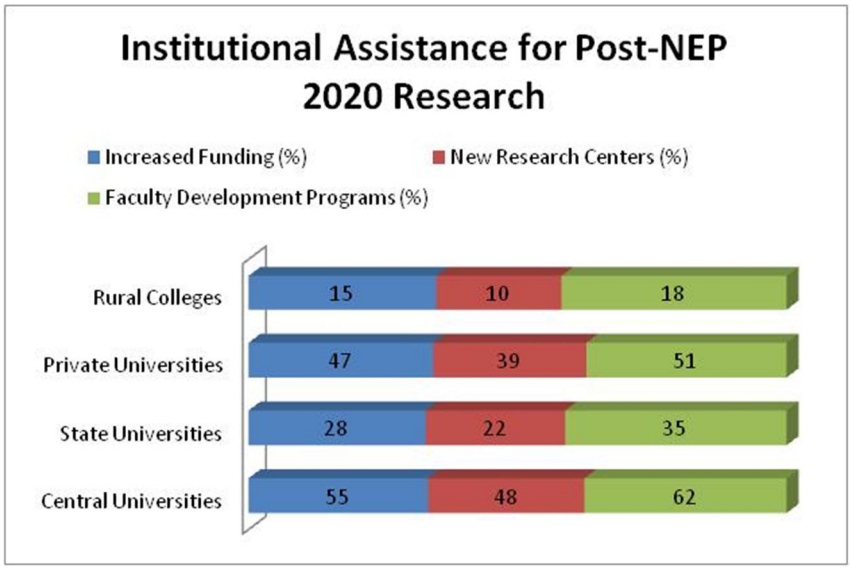
Respondent Category	High Awareness (%)	Moderate Awareness (%)	Low Awareness (%)
Faculty (n=120)	62	28	10
Students (n=150)	41	35	24
Administrators (n=30)	80	13	7



- Interpretation: The students had very little understanding of NEP 2020 regulations, whereas administrators demonstrated the highest level of awareness. These points to a communication breakdown in the process of distributing policies to students.

2) Institutional Assistance for Post-NEP 2020 Research

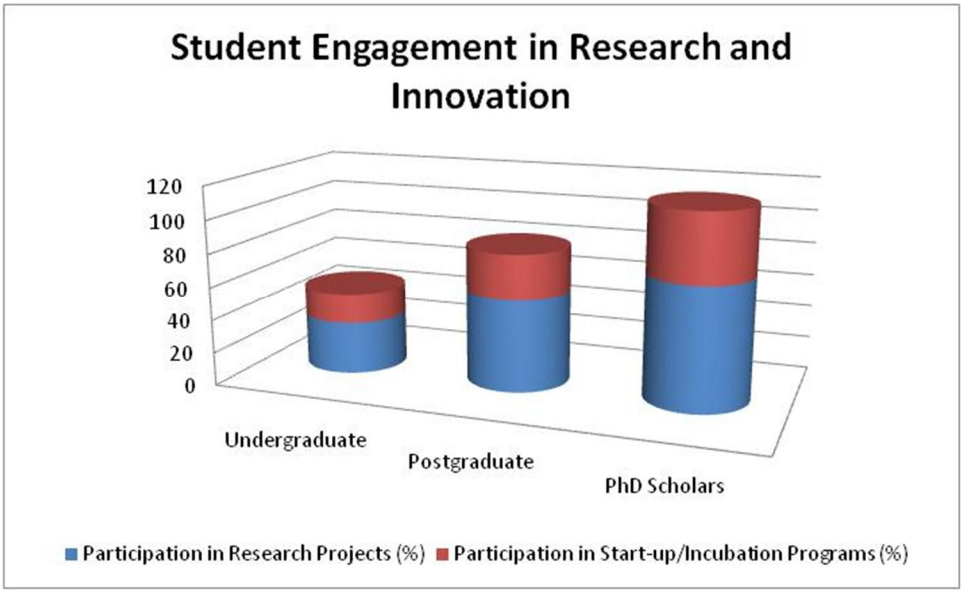
Institutional Type	Increased Funding (%)	New Research Centers (%)	Faculty Development Programs (%)
Central Universities	55	48	62
State Universities	28	22	35
Private Universities	47	39	51
Rural Colleges	15	10	18



- Interpretation: In terms of research assistance, central and private universities are responding well to NEP 2020, but state and rural universities are lagging behind, suggesting uneven implementation.

3) Student Engagement in Research and Innovation

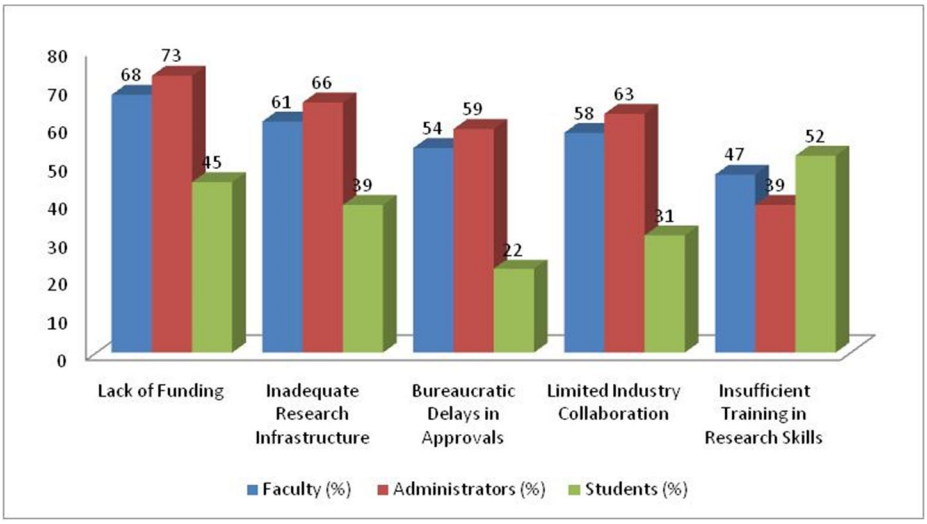
Student Level	Participation in Research Projects (%)	Participation in Start-up/Incubation Programs (%)
Undergraduate	32	18
Postgraduate	56	27
PhD Scholars	74	41



- Interpretation: NEP 2020 has led to greater emphasis on involving students in research, particularly at the postgraduate and PhD levels. However, undergraduate participation remains limited.

4) Perceived Difficulties with NEP 2020 Research Reform Implementation

Challenge Area	Faculty (%)	Administrators (%)	Students (%)
Lack of Funding	68	73	45
Inadequate Research Infrastructure	61	66	39
Bureaucratic Delays in Approvals	54	59	22
Limited Industry Collaboration	58	63	31
Insufficient Training in Research Skills	47	39	52



- Interpretation: Lack of funds and limitations in infrastructure were identified by all parties as the biggest obstacles to putting NEP 2020 research mandates into practice.

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VI. DISCUSSION

The results show that NEP 2020 has had a varied but generally beneficial effect on the culture of research and innovation in Indian higher education institutions.

A. Awareness and Policy Communication

The Students, especially those enrolled in undergraduate programs, show less understanding of NEP 2020 than do administrators and teachers. This indicates a communication gap in policy, which might make it more difficult for students to participate in research projects. If awareness initiatives are not incorporated at the student level, NEP 2020's goal of fostering a research attitude "from early stages of education" may not be fully realized.

B. Institutional Implementation Disparities

Disparities between state/rural and central/private universities are amply demonstrated by the data. Proactive measures like establishing research centers and providing faculty development programs have been demonstrated by central universities and well-funded private institutions. State and rural universities, on the other hand, have limited flexibility due to structural and budgetary limitations. Concerns over unequal implementation across various Indian HEIs are echoed in previous work (Pathak, 2022).

C. Student Engagement in Research and Innovation

In line with NEP 2020's focus on entrepreneurship and innovation, there is positive evidence of a rise in postgraduate and doctorate student involvement in research and start-up ecosystems. Undergraduate research engagement is relatively low, nevertheless, indicating that institutional frameworks to promote early-stage research involvement are still developing even if policy measures are in place.

D. Persistent Challenges

According to the poll results, the biggest obstacles continue to be a lack of funds, poor infrastructure, lengthy bureaucratic processes, and limited industry ties. This indicates that although NEP 2020 offers a visionary framework, execution is nevertheless hampered by institutional constraints. The NRF's anticipated impact could not be as great without strong financial support and industry cooperation.

VII. FINDINGS

1) NEP 2020 has had a favorable impact on research culture, particularly at private and central institutions.
2) Implementation disparities continue to be an issue, especially for state and rural institutions.
3) Although undergraduate engagement in research is currently below expectations, student involvement is increasing.
4) The most urgent issues are infrastructure, funding, and industrial connections.
5) To achieve NEP 2020's full potential, more focus must be placed on faculty training, awareness campaigns, and fair resource distribution.

VIII. RECOMMENDATIONS

Under NEP 2020, a number of strategic recommendations may be made to enhance the research and innovation culture in Indian higher education based on the results of the data analysis and discussion:

1) Enhance Awareness and Policy Communication
- Hold frequent orientation sessions, workshops, and seminars to help professors and students better grasp the requirements of NEP 2020.
- Include NEP 2020 concepts in undergraduate courses to provide early exposure to innovative and research methods.

2) Strengthen Funding and Infrastructure Support
- Provide state and rural institutions with sufficient resources so they may establish libraries, innovation centers, and research labs.
- Create virtual labs and shared research spaces for universities with limited resources to promote cooperation.

3) Promote Industry-Academia Collaboration
- To encourage applied research and the commercialization of breakthroughs, establish official collaborations with businesses, start-ups, and government research organizations.

- Promote internships, group projects, and knowledge-sharing initiatives to connect students with practical research problems.

4) Develop Faculty and Student Capacity

- Establish training programs for academic members in grant writing, innovation management, and research methods.
- Plan hackathons, research mentoring programs, and workshops for students to foster an entrepreneurial and inquisitive atmosphere.

IX. CONCLUSION

Having the goal of establishing an environment that is focused on innovation and research, the National Education Policy 2020 offers a revolutionary vision for Indian higher education. This study shows that NEP 2020 has increased student participation at the postgraduate and doctorate levels and had a favorable impact on research culture, particularly in central and private institutions.
Significant obstacles are also shown by the data, such as differences in institutional ability, a lack of money, poor infrastructure, little business cooperation, and unequal student awareness. In order to achieve NEP 2020's goal of an inclusive, interdisciplinary, and internationally competitive research environment, these issues must be resolved. Indian higher education institutions may promote a long-lasting culture of research and innovation by raising awareness, bolstering facilities and financing, establishing industry connections, and placing a strong priority on the development of professors and students. Future studies will also be necessary to track developments, assess results, and offer evidence-based suggestions for ongoing policy enhancement. In conclusion, NEP 2020 has the potential to make India a center of knowledge and innovation on a global scale, but its success hinges on its efficient execution, fair resource allocation, and active involvement from all parties involved in the higher education system.

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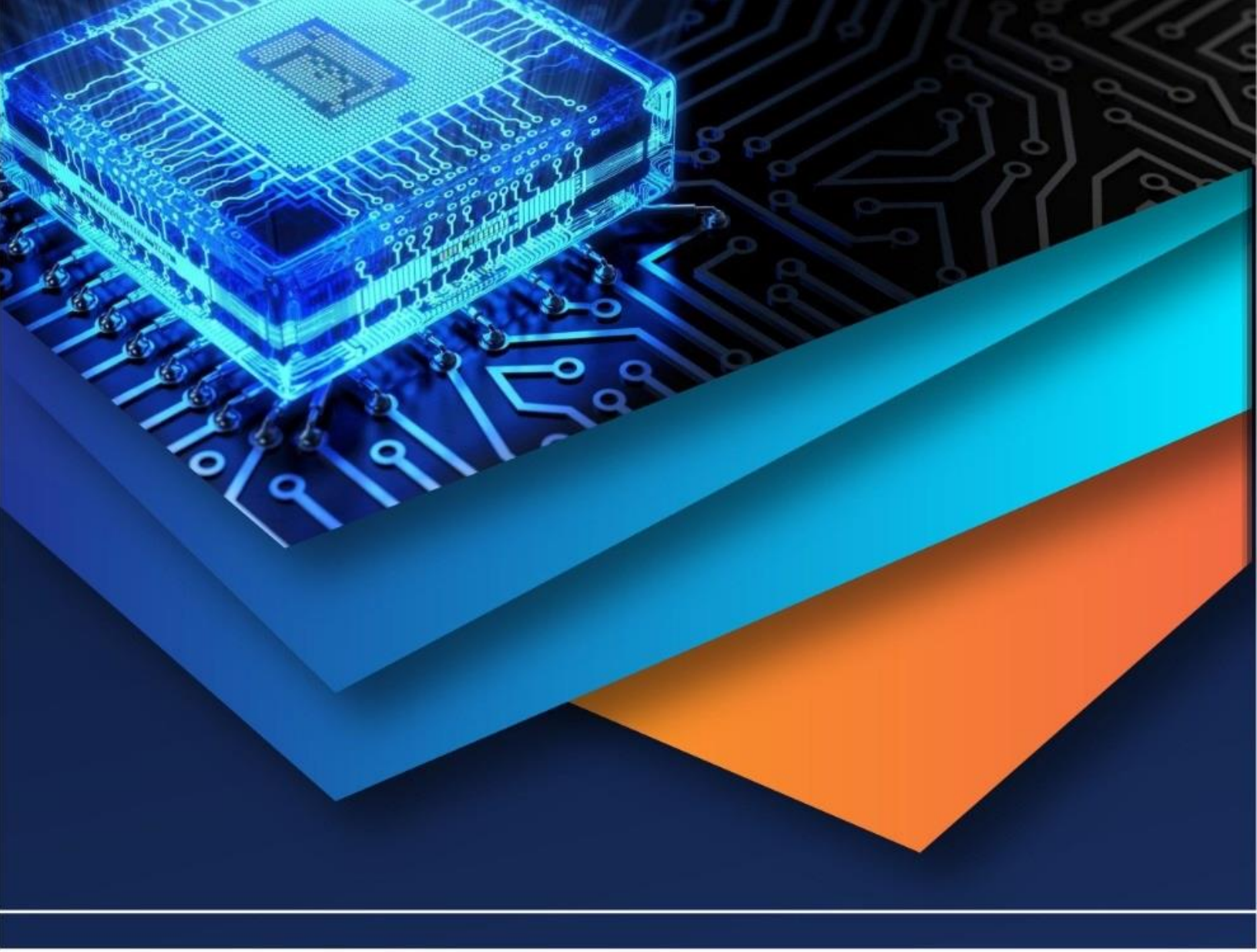

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