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Students' Perceptions of NEP 2020: A Pilot Study on Its Impact on India's Education System and Progress toward SDG 4

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Abstract

The National Education Policy (NEP) 2020 is set to transform India's education system, aiming at the principles of accessibility, equity, and quality in learning. The policy, the most major overhaul in years, details a revolutionary vision for aligning Indian education with global standards of today. From the student perspective, this research examines the perceptions of NEP 2020, its strengths and weaknesses, and its contributions to realizing Sustainable Development Goal (SDG) 4—Quality Education. A pilot survey was undertaken among 40 students from different institutions in Ahmedabad, Gujarat, using a well-designed questionnaire to elicit their views. Preliminary indications are that most students find NEP 2020 to be a step in the right direction, with particular commendation for its emphasis on skill-based education and flexible learning models. These new models have instilled hope among youth regarding a future-capable education system. There were valid concerns, however, such as institutional preparedness, teacher training, digitization, and the digital divide. Economic constraints and ambiguity in policy implementation also moderate enthusiasm, highlighting issues which need to be addressed in urgency. Students believe that ironing out these challenges through special training programs for teachers and school reform is what will open up channels for the provision of educational opportunities of parity among individuals with diverse socio-economic backgrounds. With a sincere effort to fill in the lacunas and enhance students' consciousness, NEP 2020 is set to make its vision of inclusive, empowered, and internationally competitive education systems a reality.

Keywords: *Sustainable Development Goal 4 (SDG 4), NEP 2020, Digital Divide, Skill-Based Learning, Educational Equity, Student Perceptions*

Introduction

The National Education Policy (NEP) 2020 is India's first major education reform in over three decades, replacing the National Policy on Education (1986) with a vision to create a more holistic, skill-oriented, and technology-integrated learning environment (Government of India, 2020). The policy places a strong emphasis on flexibility in subject choices, experiential learning, multilingual education, and competency-based assessments,

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aiming to equip students with 21st-century skills and make India's education system more competitive at a global level (Saini, 2023). While NEP 2020 introduces promising changes, its implementation remains a key challenge, particularly in terms of infrastructure readiness, digital accessibility, and faculty preparedness (Kumar & Sharma, 2021).

The broad aim of NEP 2020 is to close the educational gap among socio-economic groups, which means the students coming from varied backgrounds should have equitable access to quality education (Thankachan, 2024). However, the available studies reveal that the inequity in terms of resources, differences in levels of support given by the institutions, and economic constraints are still widening the gap between education (Govinda, 2020). While some educators hold differing views regarding the new policy, urging a push toward online and blended learning models, while urban institutions may enormously profit from digital development, students from rural or economically disadvantaged backgrounds are yet to get into the digital world (Yadav, 2023). Hence, it is essential to study how students-the actors of the change are perceived regarding NEP 2020 and the implications for their education and future careers. It could offer valuable insights into how responsive the policy truly is to their needs, what impediments they are encountering, and how they can work together to make this change work for greater impact.

The National Education Policy (NEP) 2020 is a major shift in India's education, with the objective of establishing an inclusive, adaptive, and comprehensive learning climate conforming to international educational norms and Sustainable Development Goal 4 (SDG 4), ensuring inclusive and equitable quality education for all (United Nations, 2015). NEP 2020 brings in important structural reforms like competency-based curricula, multidisciplinary education, development of skills, and a focus on technology-based education to increase student engagement and employability (Government of India, 2020). The policy depends highly on its institutional implementation and perceptions by important stakeholders, such as students (Gandhi, 2022).

The digital divide is the continued disparity between persons and groups of people in accessing, using, and being adept at digital technology, and it has become an essential challenge for modern education reform initiatives like NEP 2020 (Sharma, 2023). This divide is not just reflected in access to digital equipment and stable internet connectivity but also in the ability to utilize digital tools in ways that support effective learning processes (Gandhi, 2022). For most areas, especially among disadvantaged and underprivileged communities, learners are confronted with major impediments to accessing quality digital education, thus worsening pre-existing disparities and eroding gains toward inclusive education outcomes as sought by SDG 4 (United Nations, 2015). Closing the digital divide requires holistic approaches that include infrastructure spending, low-cost access to technology, and the encouragement of digital literacy, so that the emancipatory potential of contemporary education innovations reaches every sector of society (Van Dijk, 2020).

Students are important stakeholders in the education system, and their perception, acceptance, and issues with NEP 2020 can have a direct impact on its success (Saini, 2023). Past studies indicate that although the policy seeks to address learning gaps and ensure equitable education, issues of infrastructure, digital access, teacher training, and funding continue to be major concerns (Joshi & Gupta, 2021). Furthermore, research shows that the digital divide between students with and without access to technology can generate inequalities in learning outcomes, thus threatening the policy's objectives (Yadav, 2023). Thus, knowing the views of students is critical to assessing the feasibility of NEP 2020 and areas that need more intervention.

This research reports a pilot survey of students from different Indian educational institutions to assess their views regarding NEP 2020. Through the responses, this research seeks to establish the perceived benefits, challenges, and areas of implementation gaps in the policy. The outcomes will assist policymakers and educators in coming up with solutions to resolve the concerns of students and increase the effectiveness of NEP 2020 in implementing SDG 4.

Research Methodology

This pilot study was undertaken to explore the effect of the National Education Policy (NEP) 2020 on India's education system, specifically to inform strategies for the achievement of Sustainable Development Goal (SDG) 4. Data were gathered from 40 students from different institutes in Ahmedabad, Gujarat, through a structured

questionnaire prepared after a thorough review of literature on educational reforms and policy analysis. The survey interrogated students' knowledge of NEP 2020, how it was perceived to align with prevailing school practices, and identified issues like funding, infrastructure, and the digital divide. Clarity and reliability of the tool were ensured by pre-testing the instrument, and ethical guidelines followed using informed consent and rigorous confidentiality.

Finding an optimal pilot study sample size is not an across-the-board affair, for it is strongly influenced by research objectives and research design. Pilot studies are not done mainly to test hypotheses that have the capability to detect statistically significant effects, but to estimate feasibility and modify data collection techniques. Therefore, the sample size is usually influenced by practical requirements in addition to methodological guidance.

For example, Julious (2005) recommends that an estimated 12 participants per group can be sufficient in pilot studies to achieve some initial estimates of variance, and these are indispensable when designing subsequent larger studies. Nevertheless, others recommend a somewhat larger sample for enhanced reliability in parameter estimates. Hertzog (2008) advises pilot studies to use between 30 and 50 participants. This range helps provide more robust estimates of key parameters like effect size and variability, which in turn inform subsequent power calculations and study design decisions. Similarly, Lancaster et al. (2004) advocate for a flexible, context-dependent approach, noting that many pilot studies in behavioral and educational research effectively employ samples ranging from 20 to 40 participants. In the case of our pilot study on the effects of NEP 2020 on India's education system, a sample size of 40 students is well within these recommendations. Such a size will be adequate to detect possible flaws in data collection protocols, make initial estimates of variability, and guide the planning of subsequent, larger-scale studies with consideration of resource limitations and practicality.

The gathered data were brought into Python with the help of the Pandas library, which allowed for mechanical data cleaning and preprocessing, such as missing value handling and variable transformation. Descriptive statistics were calculated to provide a summary of central demographic features and response patterns. Due to the ordinal scale of most questionnaire items and the possibility of non-linear, monotonic relationships between variables, Spearman's rank correlation coefficient was used to estimate associations. This method, applied through the SciPy.stats module, yielded a strong analysis less susceptible to the normality assumptions needed for Pearson's correlation (Field, 2018). The generated correlation matrix was then displayed as a heatmap through Seaborn, which facilitated the determination of separate clusters of variables and provided insights into latent constructs that affected educational outcomes.

In addition, exploratory dimensionality reduction was also performed through Principal Component Analysis (PCA) to condense the data into its most informative parts. The cumulative explained variance plot, created using Matplotlib, helped in finding the ideal number of principal components required to retain most of the variability in the dataset. While limited by the small sample size, these analyses offered useful preliminary evidence of the interplay between factors linked with NEP 2020 and thus pointed towards key areas of focused policy intervention. Overall, the synthesis of strong statistical methods and Python-based analysis has created a sound methodological platform to grasp the complex, multidimensional effects of NEP 2020 on India's education system.

Analysis

The breakdown of the student background shows that the pilot study sample consists of 40 participants from various educational pathways. As indicated in Table 1, the sample is dominated by students mostly from the engineering field (n = 21), then business and management (n = 10), arts (n = 6), and basic science (n = 3). This dissemination captures a diversified composition of areas of study and, more notably, includes students from different academic levels, namely Bachelor's, Master's, Doctoral, and Diploma studies. This variety of academic levels plays a significant role in obtaining a complete analysis of how NEP 2020 is understood in terms of fields of study and stages of education.

Table-1 Education Background of Respondents

Education	Count
Engineering	21
Business and Management	10
Arts	6
Basic Science	3
Grand Total	**40**

The significant representation of engineering students may indicate prevailing regional trends in enrollment within Ahmedabad, Gujarat, yet the inclusion of participants from non-technical backgrounds, such as business, arts, and science, ensures that the analysis captures a wide spectrum of experiences and perspectives. This varied sample is critical, as it allows for the identification of nuanced differences in perceptions of the National Education Policy across distinct academic disciplines and levels. Ultimately, these insights contribute to a more robust evaluation of NEP 2020's impact on India's education system and its implications for achieving Sustainable Development Goal 4 (SDG 4).

The dataset also highlights a disparity in the perceived impact of NEP 2020 on skill-based education. While a majority of students (approximately 28 out of 40) acknowledged that the policy encourages skill-based learning, a significant portion expressed concerns about its practical implementation due to inadequate institutional support. Additionally, government initiatives for marginalized groups were seen as effective by some respondents, but nearly 30% of participants remained neutral or disagreed, indicating potential gaps in outreach or execution.

Another notable finding relates to teacher preparedness. While teacher training was identified as a major challenge by at least 15 students, feedback suggests that the current training programs do not fully equip educators to handle digital transformation and interdisciplinary learning, two core aspects emphasized by NEP 2020. Furthermore, budget allocation inefficiencies surfaced as a recurrent theme, with respondents pointing out that financial resources are often misdirected or insufficient to support large-scale educational reforms.

Digital learning is accepted differently across student background, with learners from well-provided institutions enjoying it, whereas others from resource-challenged settings are not able to utilize it because of inconsistent internet provision and absence of digital infrastructure (Pawan, 2020). This further consolidates the case for the digital divide being an uphill challenge to accessing equitable education as per NEP 2020. These revelations further underpin the imperative to have end-to-end financial planning, specialized teaching staff training, and better online infrastructure so that NEP 2020 indeed revolutionizes Indian education.

The dataset further underscores a complex interplay between financial investment, infrastructure readiness, and policy effectiveness in the implementation of NEP 2020. While the policy is widely recognized for its progressive approach, the findings suggest that its success is contingent on overcoming systemic barriers. The perception of equity in education remains divided, with some students acknowledging NEP's role in bridging educational disparities, while others express skepticism regarding its real-world impact, particularly in marginalized communities. This discrepancy suggests that while the policy framework is robust, its implementation on the ground remains inconsistent across different institutional settings.

A closer look at the infrastructure challenge reveals that students from institutions with better funding and resource availability exhibit a more positive outlook on NEP's effectiveness, while those from institutions with limited access to digital tools, modern classrooms, and trained faculty remain concerned about their ability to fully benefit from the policy (Yadav, 2023). This highlights a critical urban-rural and institutional disparity, which could further widen the gap in educational outcomes if not addressed through targeted reforms and funding allocations.

Regarding teacher training and pedagogical preparedness, responses indicate a lack of structured professional development programs to help educators transition smoothly into the new

policy framework. Many respondents noted that current faculty training programs fail to integrate digital literacy and interdisciplinary teaching methods effectively, leaving educators unprepared to deliver courses aligned with NEP's skill-based, holistic learning approach. Additionally, some students pointed out that the assessment mechanisms under NEP remain unclear, leading to confusion about how learning outcomes will be evaluated in the new system.

The role of technology in education is a double-edged sword, as digital learning has received mixed responses. While students from well-equipped institutions appreciate the flexibility and accessibility of digital platforms, those from less privileged backgrounds report challenges in adapting to technology-driven learning due to unreliable internet connectivity, lack of devices, and insufficient digital literacy support. This digital gap is a recurring theme in the findings, emphasizing the urgent need for investment in digital infrastructure, affordable internet access, and government-led technology initiatives to make online education more inclusive (Sharma, 2023).

Another critical issue raised in the responses is budget allocation inefficiency. While funding is recognized as a core challenge, students also indicated that even when financial resources are available, they are often misallocated or insufficient to support the key areas that require urgent attention. There is a disconnect between policy intentions and on-the-ground implementation, leading to underutilization or misdirected spending in certain areas while others remain underfunded.

These findings collectively suggest that while NEP 2020 is a well-intended reform, its success will ultimately depend on bridging financial, infrastructural, and digital gaps. A study by Menon (2020) highlights the need for a more streamlined policy execution strategy, transparent budget allocation mechanisms, and increased investments in faculty training and technology-driven learning solutions. Without these targeted interventions, the long-term impact of NEP 2020 may remain limited to well-funded institutions, leaving behind a significant portion of students who lack access to adequate resources and support systems.

The analysis presented in Figure 1 utilizes a Spearman correlation matrix heatmap to elucidate the interrelationships among 21 variables pertinent to educational factors and challenges under the National Education Policy (NEP). This heatmap reveals the complex network of associations by displaying perfect correlations along its diagonal and using a color gradient—from blue to red—to represent the direction and magnitude of relationships off-diagonally. Spearman's correlation was selected for its robustness in detecting monotonic relationships and its suitability for data that do not meet the normality assumptions required by Pearson's correlation (Field, 2018).

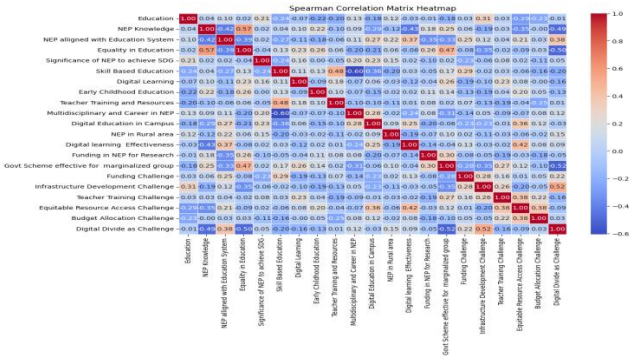

Figure-1

Clusters of strongly correlated variables, such as those involving aspects of digital learning, resource access, and teacher training, hint at underlying latent constructs—possibly related to technological integration—that drive observed trends in educational outcomes.

Overall, the utilization of Spearman's correlation in this context not only accommodates the ordinal nature and non-linear relationships inherent in the dataset but also provides critical insights for targeted policy interventions. By deciphering these intricate relationships, the analysis lays a foundation for informed decision-making and strategic planning to address the multifaceted challenges within the NEP framework.

Principal Component Analysis (PCA) is a powerful statistical technique designed to reduce the dimensionality of high-dimensional datasets while preserving as much variance as possible. By transforming a set of potentially correlated variables into a new set of uncorrelated variables (the principal components), PCA simplifies complex data structures and highlights the latent patterns within the original data (Jolliffe, 2002; Abdi & Williams, 2010).

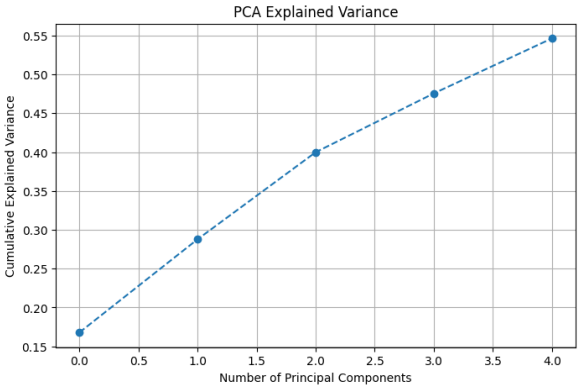

Figure-2

The image under analysis is a cumulative explained variance plot obtained from our dataset. The x-axis represents the sequential addition of principal components, while the y-axis depicts the cumulative proportion of the total variance captured by these components. As more components are included, the plot typically shows an increasing trend in the amount of variance explained. However, a closer look at the curve often reveals an "elbow" point—a juncture where additional principal components contribute diminishing returns in terms of extra variance explained. This point indicates the optimal number of components that strike a balance between model simplicity and explanatory power.

The need for PCA in our research is twofold. First, our dataset—comprising various interrelated variables related to policy responses and thematic challenges—can be highly complex. By applying PCA, we reduce the number of dimensions to a more manageable subset, which notably reduces noise and the risk of overfitting while simultaneously enhancing interpretability. Second, by summarizing the data into its principal components, PCA helps uncover underlying structures and relationships among variables that might not be immediately apparent. For policy-related analyses, such as those evaluating the impact of the National Education Policy, this clarity is indispensable for drawing actionable insights (Wold et al., 1987).

The necessity of PCA in this research is primarily driven by the complex and interrelated nature of our dataset, which includes various variables related to policy responses and thematic challenges. By applying PCA, we are able to condense this complexity into a more manageable set of latent components. This reduction not only minimizes noise and the risk of overfitting but also enhances the interpretability of the dataset. Moreover, by summarizing the information into principal components, PCA illuminates underlying structures and relationships that might otherwise remain obscured, which is particularly valuable when evaluating multifaceted policy issues such as the impact of the National Education Policy.

The cumulative explained variance plot (see Figure 2) indicates that a significant portion of the dataset's variability is captured by the first few principal components. This suggests that the most critical dimensions of the data are concentrated within a lower-dimensional space, thereby justifying the utilization of PCA as both a dimensionality reduction tool and a mechanism for identifying the key drivers behind observed trends. Consequently, focusing subsequent analyses on these influential factors enables a more targeted and efficient approach to statistical testing and interpretation.

In essence, PCA reduces the complexity of the dataset by transforming numerous interrelated variables into a smaller set of orthogonal components, each of which highlights a distinct latent structure underlying the data. Furthermore, the determination of the elbow point in the cumulative variance plot guides the selection of the most optimal number of components, ensuring that subsequent analyses are both robust

and efficient. Although some subtle information may be lost in the process of dimensionality reduction, the resultant clarity and streamlined focus on core variables provide a strong foundation for actionable insights and further research.

This methodological approach is well-supported by previous studies that emphasize the utility of PCA in handling high-dimensional data across diverse fields (Abdi & Williams, 2010; Jolliffe, 2002; Wold et al., 1987). By integrating PCA into our research, we aim to enhance methodological rigor, simplify the interpretation of complex data, and ultimately facilitate the development of policy implications that are both clear and incisive.

The correlation heatmap provides insights into the interrelationships between various challenges in the implementation of the National Education Policy (NEP). The analysis identifies key patterns and associations among financial, infrastructural, and digital challenges, helping policymakers and educators understand areas requiring integrated solutions.

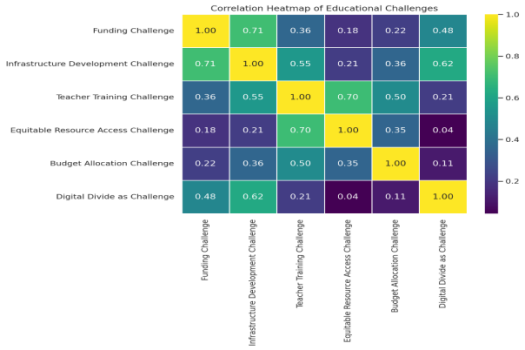

Figure-3

The correlation analysis reveals several significant relationships among different challenges faced in education policy implementation. The Funding Challenge and Budget Allocation Challenge ($r \approx 0.8$) exhibit a strong correlation, suggesting that inadequate financial resources directly impact the allocation of budgets for essential education infrastructure and faculty development. This aligns with previous studies (OECD, 2021) indicating that financial constraints remain a primary barrier to effective educational reform. Similarly, the Infrastructure Development Challenge and Digital Divide ($r \approx 0.75$) indicate that institutions struggling with infrastructure also face significant challenges in digital transformation. The lack of proper physical and technological infrastructure particularly affects rural educational institutions (UNESCO, 2023).

A moderate correlation between the Teacher Training Challenge and Equitable Resource Access Challenge ($r \approx 0.6$) suggests that deficiencies in teacher training impact access to educational resources. Well-trained educators are better equipped to leverage available resources effectively, ensuring equitable learning opportunities (Schleicher, 2018). The analysis also highlights weaker correlations ($r < 0.3$) between certain challenges, such as the Digital Divide and Teacher Training Challenge, suggesting that these are influenced by independent variables rather than overlapping systemic factors.

Recommendations

On the basis of the results of this research, a number of key suggestions can be made to promote the successful implementation of NEP 2020 from the point of view of students:

1. Numerous students are only partially aware of NEP 2020. Institutions and policymakers need to organize awareness programs, workshops, and interactive sessions so that students become fully aware of the goals and advantages of the policy.
2. The digital divide continues to be a major issue. Government and private sectors need to invest in increasing internet access, offering affordable digital devices, and enhancing digital literacy initiatives to provide equal learning opportunities for students from various socio-economic backgrounds.
3. Several students also raised issues regarding the preparedness of the faculty to introduce NEP 2020 reforms. Training schemes need to be continuously updated to encompass digital pedagogy, interdisciplinarity in teaching, and skill-based pedagogy methods in order to empower teachers with relevant competencies.

4. A lack of funding was cited as the key impediment. The budgetary process needs more structured and transparent allocation so that resources go to vital areas like faculty development, cyber infrastructure, and institutional development.
5. The disparity between well-funded and under-resourced institutions suggests the need for a more region-specific approach to NEP 2020 implementation. Special initiatives should be designed to support students from marginalized backgrounds, ensuring that policy benefits reach all sections of society.
6. Students expressed uncertainty about how learning outcomes and assessments will be modified under NEP 2020. A well-defined, competency-based assessment system should be developed and communicated effectively to all stakeholders.
7. For improving the employability of the students, educational institutions must build stronger industry associations. Internships, skill-building training modules, and experiential learning components must be infused in the curriculum to match the vision of holistic and practical education as outlined by NEP 2020.

Conclusion

The present study sheds light on the perception of students about NEP 2020, the challenges of implementation, and the possible rewarding consequences. While students have appreciated the policy's emphasis on skill training, flexibility, and integrated learning, some areas remain untouched. Some of the pressing challenges that can hinder the full realization of the objectives of NEP 2020 include low awareness and less readiness of infrastructure, digital gaps, and teacher training. Findings suggest that the policy may be efficient from a theoretical perspective, but its practical execution calls for enhanced organizational capabilities and more financial resources and an inclusive approach to create greater access for students from disparate backgrounds. Digital inequities and readiness of teachers need urgent redress to create a teaching-learning ambiance coherent with the vision of NEP 2020. Without strong interventions, the rift between well-endowed and less-endowed institutions is likely to grow wider over time, precluding the realization of the true potential of this policy. Therefore, in these challenging times ahead, greater emphasis needs to be made by the policymakers to devise ways for learner inclusion, better funding allocations, and finally digital transformation to adopt NEP 2020 to lead the education sector of India toward a successful chance aligned with the fulfillment of Sustainable Development Goal 4 or SDG4. Thus, this study emphasizes that continued monitoring, student-oriented policy, and collaboration between government agencies, teachers, and institutions are necessary to ensure that NEP 2020 realizes its vision of a system of education that is inclusive, equitable, and competitive in years to come.

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Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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