

Analyzing Public Sentiment Towards the New Education Policy: A Data-Driven Approach

Md Amaan Khan
Noida Institute of Engineering and
Technology
(Affiliated to AKTU)
Greater Noida, India
amaankhanak2001@gmail.com

Vivek Bansal
(Department of CSE)
Noida Institute of Engineering and
Technology
(Affiliated to AKTU)
Greater Noida, India
Vivek.bansal1977@gmail.com

Anurag Verma
Noida Institute of Engineering and
Technology
(Affiliated to AKTU)
Greater Noida, India
anurag22november@gmail.com

Hitesh Singh
(Department of CSE)
Noida Institute of Engineering and
Technology
(Affiliated to AKTU)
Greater Noida, India
Hitesh.singh.85@gmail.com

Abstract—The year 2020 has been an exceptional year for countries across the globe. In Indian, aside from COVID-19, one of the significant developments in India was the creation of the New Education Policy (NEP) 2020. Researchers have become interested in this as a result of committee recommendations throughout time to raise the education expenditure to 6% of GDP. The purpose of this document is to list the issues and priorities for NEP 2020. The writers have employed computer-assisted qualitative data analysis tools to solve the issues and qualitative data analysis methodologies to comprehend important areas of attention of policy texts.

Keywords—New Education Policy (NEP), India, Qualitative Analysis, Thematic Analysis, TF-IDF Vectorizer, Random Forest Classifier, NLTK, Sentiment Analysis, formatting, Opinion Mining, Education Policy.

I. INTRODUCTION AND RELEVANT LITERATURE

International education systems are designed to advance further (Rizvi & Lingard, 2009). The National Policy on Education (NPE), developed by the Government of India (GOI), aims to integrate common people into the mainstream and support education across all economic strata. This strategy covers a wider range of educational settings, including both rural and urban ones, from elementary school education (literacy level) to higher education institutions (specialization). The Government of India (Govt. of India, 2020) proposed and disseminated the first NPE in 1968, followed by a second policy in 1986 and a third significant reformative policy in 2020, both of which were announced by the country's current prime minister, Narendra Modi.

I. Review of the Literature

The year 2020 has been an exceptional year for countries across the globe. In India, apart from Covid19, one of the important changes that took place was the development of the New Education Policy (NEP) 2020. Time by time, various committees have recommended to increase the allocation of

the budget for education to 6% of the GDP, this has lead to the interests of researchers. This paper aims to identify the concerns and focus of NEP 2020. The authors have utilized qualitative data analysis techniques to understand critical areas of focus of policy documents and computer-assisted qualitative data analysis software to address the issues. The research also uses data from Twitter. The data (policy documents) was downloaded from the Ministry of Human Resource Development (MHRD) website. For a better understanding of the collected data, Word Cloud, TreeMap, Project Map, and The Mind Map, along with the graphical representation of sentiments of stakeholders, is presented in the paper. The paper identifies three crucial aspects of the policy – course, language, and students, for the higher education sector. This paper also discusses the sentiment analysis, related to NEP 2020. It was found that most of people consider the policy as a positive and welcoming step.[1]

This research delves into public perceptions of the new education system, leveraging sentiment analysis on Twitter data. By tapping into natural language processing and machine learning, the study aims to decode sentiments from diverse user groups, including educators, students, policymakers, and parents. The methodology entails amassing a substantial dataset of tweets related to educational reforms, followed by preprocessing to refine the data and sentiment analysis to categorize tweets as positive, negative, or neutral. Moreover, demographic analysis is integrated to unveil trends among various user segments.

The findings offer invaluable insights into the prevailing sentiment surrounding the new education system, pinpointing areas of approval and concern. This research not only enriches our comprehension of societal attitudes towards educational reforms but also sets a precedent for future studies employing sentiment analysis on social issues. The fusion of Twitter mining and sentiment analysis presents a dynamic and efficient approach to gather and analyze public

opinions, fostering a nuanced understanding of the intricate landscape surrounding educational transformations.

The study's originality lies in its contribution to informed decision-making for policymakers and educational institutions. By grasping public perceptions, stakeholders can navigate potential challenges in implementing the new system effectively. Furthermore, the research sheds light on the efficacy of social media as a barometer of public sentiment in the realm of educational reforms. This study underscores the significance of embracing innovative methodologies to glean insights from real-time data sources, paving the way for evidence-based policy formulation and responsive educational practices.

[2]

This research investigates the reception of the New Education Policy (NEP) 2020 among undergraduate students in Karnataka, India, utilizing social media analysis. The NEP 2020, a transformative initiative aimed at revamping India's education system, has generated diverse reactions among students. Some applaud its ambitious objectives, while others voice concerns about its practical implementation. The study focuses on social media posts from selected institutions in Karnataka to discern students' perspectives on the NEP during its initial implementation phase.

The findings reveal a nuanced evolution in student discourse, with a notable emphasis on social responsibility emerging prominently. Keywords extracted from the social media posts reflect this shift, with recurring themes such as digital literacy, gender sensitization, social responsibility, experiential learning (eliminating rote learning), multi-disciplinary learning, and extracurricular activities. These keywords signify students' engagement with key pillars of the NEP, highlighting their evolving ideas and priorities in response to educational reforms.

Overall, the study sheds light on the dynamic landscape of student opinions regarding the NEP 2020, underscoring the importance of social media as a platform for expression and engagement. By analyzing social media discourse, the research provides valuable insights into the early perceptions and evolving priorities of undergraduate students within the context of educational reform in India.

[3]

In order to advance, nations deliberately create their educational systems (Rizvi and Lingard (2009). To ensure that people from all socioeconomic backgrounds are included in mainstream education and to advance education for all, The National Policy on Education (NPE) was formed by the Government of India (GOI). This policy covers a wide range of educational settings, including both rural and urban ones, from elementary school (literacy levels) to university education (with an emphasis on specialisation). Sentiment annotation of a document or sentence is greatly aided by the sentiment and opinion terms (Catelli et al., 2022). Unsupervised sentiment categorization requires the detection of certain words (Dolianiti et al., 2019). A sentiment dictionary is made up of lexical units, like words

or phrases, and their matching sentiment orientation in a lexicon-based approach. The sentiment orientation can be represented as real values, like ranging from -1 to +1, classes, like positive, negative, or neutral, or fine-grained classes, like very positive to very negative. The polarity of content words—adjectives (Hatzivassiloglou and McKeown, 1997; Taboada et al., 2006), adverbs (Benamara et al., 2007), verbs (Vermeij, 2005), nouns (Neviarouskaya et al., 2009a), and phrases inside a sentence or document—determines the sentiment orientation. With the English language, a number of lexicon-based techniques have been created; these approaches are all founded on the idea of an emotion dictionary. SentiWordNet (Baccianella et al., 2010), Opinion Finder (Wilson et al., 2005a), Bing Liu's Opinion Lexicon (Liu, 2012), MPQA Subjectivity Lexicon (Wilson et al., 2005b), Harvard General Inquirer (Stone et al., 1966), AFINN (Nielsen, 2011), SentiFul (Neviarouskaya et al., 2009b), Vader (Hutto and Gilbert, 2014), TextBlob (Loria, 2018), and other methods are among these methods.

II. Education Policies of India

A. Historical Evolution of Education Policies of India

One of the many problems the GOI faced after gaining independence in 1947 was illiteracy. The Government of India (GOI) has proposed and supported several programs, policies, and legislation aimed at addressing the issue of illiteracy. Maulana Abul Kalam Azad, India's first minister of education, envisioned a unified education system based on strong central government control over the educational system and policies. In order to provide suggestions for modernizing India's five education systems, the Union Government established the University Education Commission in 1948–1949, the Secondary Education Commission in 1952–1953, the Kothari Commission in 1964–1966, and the University Grants Commission in November 1956. The first Prime Minister of India, Jawaharlal Nehru, approved the Science Policy Resolution to advance science education. The Indian Institute of Technology (IITs) is one of the top educational institutes supported by the Nehru government for the purpose of advancing science and engineering. The National Council for Educational Research and Training (NCERT) was established by the Union Government in 1961 as an independent organization. This mechanism's goal is to advise governments on the creation and execution of education-related policies.

B. The First National Policy on Education, 1968

The first NEP was announced in 1968 by the government of then-prime minister Indira Gandhi, based on the findings and suggestions of the Kothari Commission (1964–1966). It was suggested that the policy undergo "radical reform" and provide equal educational chances to the rural and urban sectors in order to promote better cultural and economic growth as well as national integration. But the choice to make Hindi the official language of the country proved divisive. The teaching of the archaic Sanskrit language, which was regarded as an essential component of Indian culture and

legacy, was also promoted by this particular approach. Additionally, this strategy was designed to support physical education in order to advance the culture of sports and games. The NPE of 1968 mandated that education spending increase to 6% of the country's gross domestic product.

C. Second National Policy on Education, 1986

In 1986, Rajiv Gandhi, the former Prime Minister, launched a new National Policy for promoting education at all economic levels. The adopted policy is known for "Special Emphasis on the Elimination of Inequalities and to Sequentialise the Educational Opportunity", irrespective of the cast (scheduled caste, scheduled tribes), gender (predominantly for females), and economic status. The policy called for the expansion of scholarships, subsidies, allowances, adult education, and various other methods to promote social integration. This NPE is known for the "child-centered approach" especially for primary education, and, thus, initiated a very popular educational reform "Operation Blackboard." The objective was to develop primary schools across the country. The policy extended the open and distance university system with the Indira Gandhi National Open University (IGNOU) founded in 1985 (IGNOU, 1985). This policy has followed the philosophy of Mahatma Gandhi to promote development (both economic and social) at the bottom level in rural India (Govt. of India, 1986).

D. Revisions in Second National Policy on Education in 1992 and 2005

The NEP was updated in 1992 by the late Prime Minister PV Narasimha Rao. The Common Entrance Examination (CEE) was adopted as a result of this education programme. Manmohan Singh, the country's previous prime minister, unveiled an updated "Common Minimum Programme" policy.

Under the NEP, 1986, the Programme of Action (PoA) 1992 established a common entrance exam for all admissions to vocational and technical training programmes headquartered in India.

E. Third National Policy on Education, 2020

A Draft on NEP, 2019 was produced in 2019 by the Ministry of Human Resource Development (MHRD), and it was preceded by a number of suggestions and public discussions. Reducing curricular content is discussed in the Draft NEP as a way to improve critical thinking and important learning. Promoting comprehensive experiential, discussion-, and analysis-based learning is the goal. For the first time, it also discusses a curriculum overhaul. The main shift is in the educational framework, which goes from a 10 + 2 + 3 system to a 5 + 3 + 3 + 4 system. An attempt is being made to maximise learning in accordance with children's cognitive development. On July 29, 2020, the Senate's cabinet approved a National Education Plan (NEP) that aims to make several reforms to India's current educational system.

VI. III. METHODOLOGY

NEP 2020 in India was studied using Computer-Assisted Qualitative Data Analysis Software (CAQDAS) to determine its goals and issues. Reeves, Kuper, and Hodges (2008) and Holloway & Galvin (2016) claim that the qualitative method yields detailed, socio-contextual, and complex descriptions in addition to perceptive interpretations. Additional analysis was conducted using MAXQDA Analytics Pro. According to Perry and Jensen (2001), the current study uses an inductive technique that enables the creation of categories and identification from other theories prior to the start of the coding procedure. The main source of data was Twitter. Web Collector, a utility offered by MAXQDA, was utilized to capture the tweets for analysing the sentiments about the policy. The string used for 19 the search was (("new education policy" OR "NEP") AND "2020").

In total, 3,607 tweets were found in the first instance, within one week of the policy releases. The authors removed the tweets with abusive language, non-English language, and other purposeful promotional post. Finally, 3247 tweets were used in the final study.

The process of analysing the textual content using NLP is demonstrated in Figure 1.

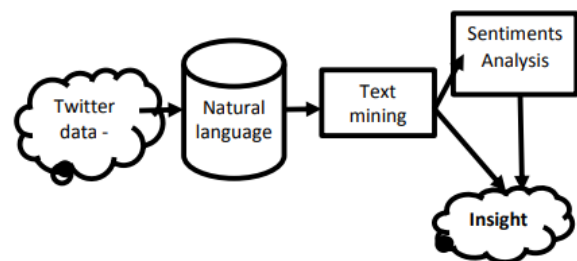


Figure 1: An Approach of Using Natural Language Pre-processing for Understanding Tweets

The flexible technique of theme analysis was used to analyse the data, allowing for adjustments in accordance with the requirements of the research and providing detailed, reliable data (Nowell et al., 2017; Braun & Clarke, 2006). Thematic analysis was chosen as a method because it naturally facilitates the investigation of human experiences in neutral environments (Percy, et al., 2015). Thematic analysis is a technique that aids in identifying, analysing, and summarising a pattern in the intricate data and frequently facilitates the interpretation of many facets of the study issue (Alhojailan, 2012).

According to Braun & Clarke (2006), the data was analysed in six steps, starting with familiarising oneself with the data, generating preliminary codes, and determining the primary themes and their sub-themes. Software for qualitative data analysis was used to meticulously improve the study's efficacy and rigour (Alhojailan, 2012).

F. Data Analysis

The data analysis procedure made considerable use of MAXQDA software to ensure the research findings were rigorous and efficient. The data set, which was obtained via Twitter, demonstrated how thoroughly the GOI examined the prerequisites for higher education. The information suggested that public opinion was taken into account as well, and that this strategy takes good care of the international education system.

G. Word Cloud

Based on the frequency and proportion of words, Word Clouds and Tree Maps were created to help visualise the results. According to their frequency in the dataset, the keywords are shown in Figure 2's Wordcloud (Sinclair & Cardew-Hall, 2008). Based on the frequency and proportion of terms, Word Cloud and Tree Map were created to improve the data's visual representation. Figure 2 According to their frequency in the dataset, various keywords are represented in a word cloud (Sinclair & Cardew-Hall, 2008). Figure 2 lists the words that appear most frequently on NEP. These frequencies are the result of data that was taken from Twitter. The highest frequency is indicated by larger word sizes. The highest size in NEP2020 is not surprising. The word cloud of common terms related to higher education is shown in Figure 2. Due to frequent use, the term NEP 2020 is widely used. Preferential terms related to technology and software (education software, app, online, STPI, Parks, Twitter, Android), as well as policy (university, plan, commencement, India), surround it.

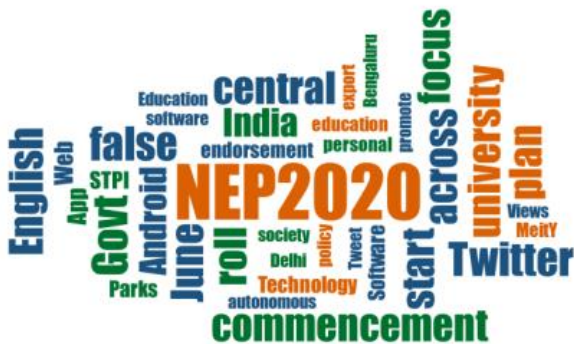


Figure 2: Wordcloud Based on the Policy Document of NEP 2020

H. Sentiment Analysis

An new topic of research called "sentiment analysis" examines how the general public feels about a given good, service, or problem by examining their ideas, viewpoints, attitudes, emotions, and assessments (Liu, 2012). According to Mustafa (2018), sentiment analysis uses sophisticated approaches to identify and extract subjective data that can be found online or offline, then merges the unstructured data. Information retrieval, knowledge management, machine learning, data mining, and natural language processing are some of these methods. These thoughts and points of view are frequently expressed in several languages, and experts use linguistic analysis to try

and decipher people's feelings. These feelings or opinions are typically classified as either favourable, negative, or neutral (Yang & Yu, 2013). When assessing people's opinions and feedback about companies and services, sentiment analysis is frequently chosen (Ainin et al., 2020).

I. PROJECT MAP

Project maps are a visual representation of the relationships between key themes and nodes within a project. These themes incorporate consistent sub-themes into a single theme. On the other hand, distinct themes contain the diverse sub-themes. A project map is made in order to investigate and show the relationships between various key concepts. When it is really difficult to find the connections between the themes, a project map is created. Round or rectangular shapes are used to symbolise the various project pieces, while connectors are used to demonstrate links between the investigation's items.

The National Education Policy 2020 is a step towards modernising the nation's current educational framework. Its main goal is to provide pupils with an excellent education. It provides students with the opportunity to learn three languages, increasing their employability across the nation. It also emphasises providing students with advanced learning tools, such as online courses and interdisciplinary approaches. NEP 2020 updates the existing assessment standards in addition to emphasising the growth of the community, stakeholders, and educational system. It evaluates the students' acquired skills both qualitatively and quantitatively, as well as their objective knowledge.

Sentiment by Rating

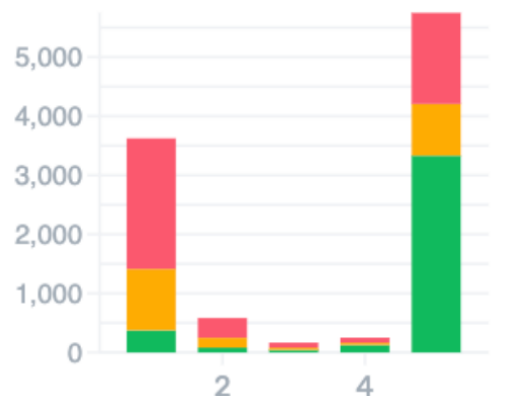


Figure 3: Bar Chart of Sentiments of Stakeholder About NEP 2020

In Figure 3, the bar chart of tweets made either positive or negative are presented. A small number of tweets during the period were extremely negative. The moderately negative tweets were slightly higher than the extremely negative tweets. When combined, the NEP 2020 seems to be having a less negative impact as indicated by this histogram. It is also clear from 11 the histogram that the majority of the tweets are moderately positive. Moreover, a small number of trees were

extremely positive. Overall, it is visible that the NEP 2020 is viewed positively by Twitter users. Positive sentiments indicate the welcome and acceptance of the NEP 2020. The number of negative tweets made for NEP 2020 is minimal in numbers, in comparison to the positive tweets.

IV. COMMENTS

Leaders and decision-makers from all over India have expressed interest in the New Education Policy (NEP) 2020, with differing views on how best to execute and evaluate it. Here are some quotes from well-known leaders regarding NEP 2020, along with an interpretation of their views:" Subsequently, you can refer to the previously supplied table, which displays the opinions of prominent figures regarding NEP 2020 in a tabular format along with labels designating whether each statement is positive or negative.

Leader	Comment	Sentiment
Narendra Modi	"The New Education Policy 2020 is based on the pillars of access, equity, quality, affordability, and accountability. It will transform the education sector and make India a global knowledge superpower."	Positive
Ramesh Pokhriyal 'Nishank'	and make India a global knowledge superpower. "Positive Ramesh Pokhriyal 'Nishank' "NEP 2020 is a comprehensive policy that aims to overhaul the education system in India. It focuses on holistic development, flexible learning pathways, and promoting critical thinking skills among students."	Positive
Amit Shah	"NEP 2020 marks a paradigm shift in the education landscape of India. It emphasizes the integration of	Positive

	technology, promotion of Indian languages, and nurturing creativity and innovation among students."	
Arvind Kejriwal	"NEP 2020 has the potential to revolutionize the education sector and empower every child with quality education. It is a step in the right direction towards achieving inclusive and equitable education for all."	Positive
Mamata Banerjee	"While NEP 2020 has commendable objectives, there are concerns about its implementation and impact on regional languages and diversity. We need to ensure that the policy is inclusive and respects linguistic and cultural diversity."	Negative

V. DISCUSSIONS AND IMPLICATIONS

In order to make education relevant to students' needs and interests at different formative stages, the National Education Policy 2020 aims to rebuild school curricula and teaching methods in a further 5 + 3 + 3 + 4 plan. These stages are the "Foundational Stage" (5 years), the "Preparatory Stage" (3 years), the "Middle Stage" (3 years), and the "High Stage" (4 years, covering grades IX, X, XI, and XII). The goal of NEP is to provide all primary school students with "universal foundational literacy and numeracy" by 2025. In order to guarantee this, the government will evaluate and accredit the schools according to several standards. The policy's main goal is to raise the gross enrollment ratio. The study makes it abundantly evident that NEP 2020's goal is to establish institutions and a supportive environment for research in higher education while fortifying India's educational foundation by promoting holistic development and providing vocational training to students as early as elementary and primary school. The outcome also showed that improving the current educational system is the government's top priority.

In addition to creating research-focused institutions, this helped students become more capable of reasoning and doing research. The Indian government's main goal in implementing NEP 2020 is to provide the mechanisms necessary to guarantee that high-quality instruction is provided in both schools and universities. Additionally, it aims to raise the standard of instruction and instill integrity in academics across the nation as well as pupils.

The NEP 2020 has a fantastic addition: school accreditation, which guarantees that students are receiving high-quality education. The policy document is divided into several sub-themes.

It deals with issues that are coming up in higher education institutions, mostly related to curriculum development, student growth, and course development. In order to allow pupils from even the most remote areas of the nation to participate in society, it also emphasises the integration of languages into the curriculum. Three main categories have been established for the construction of the course and curriculum. It is anticipated that it will assist students in choosing the course of study and career path of their choice. The language barrier is one of the biggest problems Indian students confront. Due to the lack of opportunities to learn in their native tongue, many gifted kids are unable to reach their full potential. Under the NEP, undergraduate students will have access to a variety of numerous exit options. In India, a dialect and linguistic change occurs every 20 miles. Furthermore, the government finds it difficult to guarantee that every student has an opportunity due to its massive size. The government has taken a major step in addressing language barriers by introducing the study of languages in schools, ensuring that students receive an uninterrupted education. The policy also emphasises using the native language as the medium of instruction up until grade V. If approved, it might, nevertheless, continue to grade VIII or above. In addition to the third language, which will serve as a bridging language, the student will have the choice of regional languages. It is discernible from the patterns created by the NEP 2020 content's TreeMap, Mind Map, Project Map, and Word Cloud basis investigation.

This study has also looked into tweets that favour NEP 2020, both good and negative. The futuristic NEP 2020 focuses on modernising and empowering pupils for their overall development by introducing two new approaches into the traditional Macaulayist educational system. In order for the nation to advance and eventually become a global power, it also emphasises the development of educational institutions at the secondary and tertiary levels. The NEP 2020 will concentrate on providing students with the essential skills needed in the present environment. The most advantageous aspect of NEP 2020 is the great degree of freedom in the subjects that students can choose from. Arts, Humanities, Science, Sports, and a variety of vocational disciplines are among the subjects provided. The government wants to limit vocational education to students in grade VI. The policy also offers a range of internship possibilities.

VII. CONCLUSIONS

The third National Education Policy 2020 proposes a fundamental change that addresses several aspects of

maintaining sustainability in the pursuit of high-quality education over the next several decades. The comprehensive framework is centred on the overall growth of students, teachers, HEIs, and the country. With Indianness at the centre of the proposed educational system, the policy draft skillfully incorporates modern trends and adapts western educational system aspects. Adoption of the NEP 2020 is optional for HEIs and schools, despite the fact that it provides a futuristic vision to revolutionise the Indian educational system. This study used sentiment analysis with Twitter mining and theme extraction from policy papers to qualitatively investigate the key NEP 2020 paradigms.

The three most important quotes from the NEP 2020 policy documents were those pertaining to academic courses, student centricity, and language. The graphical representations made clear how important it is to integrate ICT into the teaching and learning environment as well as HEI infrastructure. In a same vein, the NEP seeks to promote community development by providing students of all levels with knowledge-based education. The policy at HEIs called for significant adjustments to guarantee that graduates and postgraduates from these institutions had entrepreneurial and industry-level skills.

By transforming the educational ecosystem, the NEP 2020 supports high-quality education. From elementary school on up to more advanced classes, the process of experiential learning is promoted. Student creativity and innovation could be enhanced via assessment based on aptitude, ability to apply theories to real-world issues, and extracurricular activities. Both students and teachers will benefit from greater opportunities as the NEP 2020 opens the door for the best universities in the world to establish campuses in India. In the long run, it would also stop the "brain drain" problem. But the Indian government ought to plan just as carefully to generate jobs for coming generations. In summary, the policy's comprehensiveness is what makes it essential. In India, altering the traditional educational procedures requires a 360-degree approach. This could be the cause of the stakeholders' favourable opinions, perhaps. The National Education Policy (NEP) represents a significant shift in the Indian educational landscape that needs to be adopted gradually in order to observe its immediate benefits. The policy is undoubtedly progressive and satisfies the needs of educators and students generally, but its effects may differ depending on the state.

The primary concern is that although stakeholders and the general public seem to be on board, they are worried about how the policy will be implemented. Though they find the document confusing, they are excited about the idea. The policy seeks to achieve internationalisation while maintaining inclusivity and equitable opportunities. It is reported that opinions on livelihood and holistic 25 education are positive, but opinions on skill development and creating a conducive environment for innovation and research are negative. In general, a large number of people are positive about the policy, and fewer are unable to voice their disapproval. However, it is also imperative that the GoI address the issues brought up by the general people. Long-term, this would support the policy's effective implementation.

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