Reformation in the Educational System through Public Opinion using Sentiment Analysis

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ABSTRACT
A knowledgeable and skilled populace is fostered by reforming the educational system, which is a pillar of societal growth. However, in order to guide reform initiatives, it is crucial to comprehend how the general population feels and perceives the current educational system. Using machine learning methods and natural language processing techniques, this study uses sentiment analysis to determine how the general public feels about the educational system. It offers a methodology for using sentiment analysis to collect and examine public opinion on a range of topics related to the educational system, such as infrastructure, legislation, teaching strategies, and curriculum design. In order to find dominant sentiments and trends, the process entails gathering textual data from a variety of sources, including surveys, online forums, and social media platforms, and then using sentiment analysis algorithms.

Key areas of concern, including as infrastructure, teacher quality, and curriculum relevance, are revealed by our examination of internet forums, social media, and survey responses. In order to improve the educational system's quality, relevance, and efficacy in fulfilling the demands of future generations, policymakers, educators, and other stakeholders can benefit greatly from the findings.

This information can be utilized to pinpoint problem areas, rank reforms, and put evidence-based tactics into practice to raise the standard and applicability of education.

This study intends to support a more adaptable and successful educational system that is in line with the changing requirements and goals of the general public by utilizing sentiment analysis.

Keywords
Data Science, Data Analytics, Data Cleaning, Data Extraction, Machine Learning, Sentiment Analysis, Data visualization.

1. INTRODUCTION
If we compare the early part of education where many of the educators were following the Traditional way of Teaching, where the education was totally based on teacher centric but today's world it has been totally changed from Teacher centric to Learner centric which makes the educations, we dynamic, and it is continually reformed to meet the changing needs of society.

Lately, the introduction of a new education system has emerged as a key topic of debate and examination. It is essential for policymakers, educators, and stakeholders to comprehend public sentiment regarding this transformation in order to assess how these changes will be received and what impact they may have. Social media platforms, especially like Telegram, LinkedIn, Twitter have become important for extracting public opinions and sentiments in real-time.

The preface establishes the tone for a research effort that merges an inventive investigation of sentiment analysis within education reform with a courteous acknowledgment of prior scholarly contributions.

The GOI proposed and implemented the primary NPE in 1968, with the next arrangement occurring in 1986 and the third significant reformative approach taking place in 2020 under India's then-Prime Minister Narendra Modi (Govt. of India, 2020) Alterations in National Policies Following independence in 1947, the GOI faced numerous challenges, such as a lack of education. In order to address the problems associated with insufficient education, the GOI drifted and backed a range of projects, strategies, and guidelines. The strategy's key aspect is to increase the gross enrolment ratio. It is clear from the review that NEP 2020 aims to create a positive environment and establish foundations that support research in higher education institutions while strengthening India's educational framework through comprehensive development by providing vocational training to students at the primary and elementary education levels as well. Considering all factors, it has been divided into three major components. The evaluation reveals that the arrangement report is focused on developing introductory courses, advanced courses, and vocational courses for the students. Courses are designed with the aim of nurturing an understudy's mentality and inclination. The NEP aims to enhance the use of innovation in teaching. The approach includes an arrangement that emphasizes innovation or e-learning as a matter of great significance. The strategy further stipulates the establishment of a National Education Technology Forum to serve as a platform for exchanging ideas on the use and advancement of technology. Furthermore, this paper has examined both the positive and negative revies, opinion and views of tweets on Twitter, Messages on LinkedIn and on Telegrams, that support NEP 2020. The NEP 2020 is innovative and highlights the development of a well-

established school system in the context of the policy of implementing the English education system in British colonies, seeking to introduce two new strategies aimed at overhauling the system and engaging students in their holistic development. Moreover, it focuses on the development of educational institutions at both the school and higher education levels, aiming for the country to make progress and become a powerhouse in the future. The goal of this research it to present the multi-disciplinary, disciplinary, and transdisciplinary approaches to acculturating instruction, with a focus on humanities-related subjects. Currently, even a student pursuing a professional degree can learn certain subjects which must align with the human values, social values and moral values; this opportunity was not available before strategies. Moreover, this arrangement emphasizes the importance of professional skills to address emerging job requirements, as well as enhancing employability through skill development and also when the students enrol in any course they must be attentive, focused towards his or her goal-these all possible with the proper analysis of likes, dislikes, views, opinion of educators way of delivering the content. teaching methodologies etc.

2. LITERATURE REVIEW

To advance, nations strategically devise their educational systems (Rizvi and Lingard, 2009). The Government of India (GOI) has created the National Policy on Education (NPE) to foster education among all economic classes and guarantee that average citizens are part of mainstream education. Words expressing sentiment and opinion are essential for marking the sentiment of a sentence or document (Catelli et al., 2022). As per Dolianiti et al. (2019), these words must be identified for unsupervised sentiment categorization. Content words such as adjectives are used to determine the sentiment orientation based on their polarity (Hatzivassiloglou and McKeown, 1997; Taboada et al. (2006), adverbs (Benamara et al., 2007), verbs (Vermeij, 2005), nouns (Neviarouskaya et al., 2009a), and phrases within a sentence or document (Neviarouskaya et al., 2009a), and phrases within a sentence or document. A number of lexicon-based methods for English have been created, all based on the core idea of a sentiment dictionary. These methods encompass 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), among others.

In addition, this study recognizes the fluid character of social media discourse and the difficulties introduced by the changing vocabulary of online communication. Citations of foundational studies on Twitter mining (Gupta et al., 2017; Wang and Smith, 2019) and sentiment analysis methodologies (Pang et al., 2008; are integrated into the text (Liu, 2012), providing a robust theoretical basis for our analytical approaches. Prior studies in sentiment analysis have concentrated on various subjects, including political events and product launches. Nonetheless, studies that systematically examine public sentiment about educational reforms—particularly through the lens of social media—are scarce.

3. 3. RESEARCH OBJECTIVES

This research study aims to perform a thorough sentiment analysis of the public discourse regarding the new education system, using data collected from Telegram, LinkedIn and Twitter. As, theses social media platform have the extensive user base and the capacity to encapsulate varied viewpoints in brief messages, is an excellent platform for examining public feelings on numerous subjects. This research seeks to explore the nuanced expressions, opinions, and reactions of users in order to gain insights into perceptions of the new education system.

The primary objectives of this study are as follows:

To collect the users' sentiments, opinions, views, pros and cons on teaching learning methodologies like collaborative learning, inquiry-based learning, differentiated instruction, project-based learning, flipped classroom, active learning, experiential learning, student-centred inquiry, and game-based learning.

1. To evaluate the overall sentiment of Telegram, LinkedIn and Twitter users toward the recently implemented education system and all the teaching learning methodologies.
2. To investigate how sentiment varies across different demographic groups and geographical areas.
3. Finally provide the suggestive and reformative solutions to improve the education system.

4. METHODOLOGY AND DESIGN OF THE RESEARCH

In this research, Natural language processing (NLP) techniques and machine learning algorithms are used in the research to analyse social media views concerning the new education system and on various teaching learning methodologies. The dataset is gathered across a defined timeframe, guaranteeing that it represents public opinion adequately. Developing the research design for a sentiment analysis study of a new education system via Social Media mining entails specifying the general strategy, techniques, and processes for data collection and analysis.

4.1 Social Media API

The API serves as a link between developers and Social Media's platform, offering access to a wealth of data. The API, allows us to access to the required data. This comprehensive data set drives research initiatives in multiple domains, encompassing tweet content and timestamps, retweet tallies, and locational data.

4.2 Social Media Data Mining

Data mining explores the "meaning" contained within, drawing out useful insights from unstructured text such as views, opinion and tweets. This technique is widely used in business to assess customer sentiment and monitor brand perception, and it has great potential for research purposes.

Utilizing machine learning and natural language processing (NLP), reveals concealed patterns and insights from large text corpora. Its uses range from identifying trending topics and determining public sentiment to pinpointing public opinion, and they are both varied and significant. Also reveals concealed patterns and insights from large text corpora. Its uses range from identifying trending topics and determining public sentiment to pinpointing public opinion, and they are both varied and significant. Social Media data mining has a wide range of applications, including assessing public sentiment regarding events and products, identifying trending topics, and gaining insights into brand perception.

4.3 Sentiment, Emotion & Suggestions Analysis of Social Media User's Data

This study explores the fascinating realm of Social Media API's data, utilizing sentiment and emotion analysis to uncover the concealed significance of views and opinions. Our goal is to grasp the public's sentiments and views on particular

subjects, leveraging suggestion as our essential source of understanding.

4.2.1 Sentiment Analysis

Envision a huge collection of words, each mirroring a nuanced aspect of opinion. Sentiment analysis serves as a crucial tool that reveals the positive, negative, or neutral sentiments hidden in text. This study uses rule-based methods as well as machine learning approaches to accomplish this. Rule-based approaches utilize sentiment lexicons, which are like dictionaries that assign scores to words (e.g., "awesome" = positive, "terrible" = negative). Machine learning, in contrast, enables algorithms to learn sentiment patterns from extensive datasets and to continuously improve their understanding

4.2.2 Emotion Analysis

The research goes beyond mere sentiment. We delve deeper, using emotion lexicons to pinpoint the specific emotions present in reply messages, such as Excitement, Boring, and Average Expression—these subtleties provide a more detailed representation of public perception. Think of public responses not merely as declarations, but as emotional brushstrokes that come together to create a vivid canvas of public sentiment. With the help of emotion analysis, we can make sense of these brushstrokes and grasp the emotional currents in online discourse.

4.2.3 Suggestion Analysis

This study aims to gather and analyze suggestions for improving strategies for reforming the educational system. It seeks to assist educators in adopting these suggested approaches to establish a learner-centric educational environment.

4.2.4 Derive Conclusions

This study opens the way to a more profound comprehension of public opinion on social media API by merging analyses of sentiment, emotion, and suggestion with advanced methods for data collection and processing. This research goes deeper than the literal meaning of words, investigating the emotional depths of online communication and uncovering the authentic feelings and experiences that shape our digital environment.

5. DATA ANALYSIS USING PYTHON THIS SECTION ILLUSTRATES THE STEPS INVOLVED IN DATA ANALYSIS USING PYTHON.

Step 1: Perform Sentiment Analysis

Installation of Text Blob Library

pip install textblob

from textblob import TextBlob

Step 2: Now check the polarity of the statement (Opinion, views, Suggestion)

from textblob import TextBlob

TextBlob("A collaborative (or cooperative) learning approach involves everyone to participates and contribute to a common overall outcome, or work together on a shared task. !!!!!").sentiment.polarity

Create the list of Positive Comments and Negative Comments

Step 3: Wordcloud Analysis of your data

pip install wordcloud

from wordcloud import WordCloud , STOPWORDS

set(STOPWORDS)

Using imshow(wordcloud) display the wordcloud

Conclusion:

Positive Users are emphasizing more on best, awesome, perfect, amazing, look, happy etc.

Negative Users are emphasizing more on Terrible, worst, horrible, boring, disgusting etc.

Step 4: Perform Emoji's Analysis

Install emoji

pip install emoji==2.2.0

import emoji

Using counter function of Collection Framework, Compute frequencies of each & every emoji in a list.

Using Plotly, plot the graph

6. CONCLUSION

Majority of the customers are happy as most of them are using emojis like: funny, love, heart, outstanding.

Step 5: Collect Entire data of social media

Do the Following:

Find out which Category has the maximum likes

Find out whether person are engaged or not

Using corr() find the co-relation values between ['views', 'likes', 'dislikes'] and plot the same with heatmap to visualise the values.

Which Teaching methodology have the largest number of trending approach?

Using value_counts(), now count which approach has maximum trending.

Does Punctuations in title and tags have any relation with views, likes, dislikes comments

Count the punctuations

Using string.Punctuation count the Punctuations for views, likes, dislikes and display using sns.boxplot

7. REFERENCES

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