



Sentiment Analysis Of Student Feedback Mining Systems

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Abstract: The significance of collecting and comprehending student input in education cannot be overstated. Traditional methods of getting feedback through surveys and assessments can have disadvantages, such as low response rates and subjectivity. This research provides a new strategy to improving feedback gathering by creating a Student Feedback Mining System that includes sentiment analysis. The system's purpose is to automatically analyze and extract sentiment from student input, so providing educators and institutes with important insights into students' overall contentment and opinions about various parts of their academic experience. The system processes unstructured text data, identifies sentiments, and categorizes feedback as favorable, negative, or neutral. Obtaining student feedback through a variety of channels, including discussion forums, online surveys, and other feedback tools. The obtained text data should be cleaned and preprocessed to remove noise and superfluous information while also standardizing the format for analysis. Sentiment analysis methodologies and advanced NLP algorithms are utilized to determine the emotional tone of input. This entails categorizing sentiments as neutral, negative, or positive. To provide a comprehensive understanding of the various aspects influencing student satisfaction, fees are classified based on specific criteria such as course content, teaching styles, facilities, and overall learning experience. By presenting analyzed data in clear reports and visualizations, administrators and instructors may easily understand and respond to comments. Delivering feedback that allows for continual development by providing concrete ideas to help teachers improve their lesson plans, curricula, and learning environment. The proposed solution aims to overcome the constraints of traditional feedback gathering methods by automating the analysis process, providing real-time insights, and enabling a data-driven approach to education improvement. Sentiment analysis allows educational institutions and teachers to address concerns proactively, improve instruction quality, and create a more positive and exciting learning environment. Sentiment analysis allows educational institutions and teachers to address concerns proactively, improve instruction quality, and create a more positive and exciting learning environment.

Index Terms - Sentiment analysis, text processing, clustering, student feedback, and data extraction.

I. INTRODUCTION

In a vibrant learning environment, efficient evaluation of student opinions is a foundation for ongoing enhancement and enhancement of the entire educational process. Traditional feedback collection techniques frequently fail to deliver timely and insightful information because of poor response rates and the subjectivity of hand evaluations.

This study aims to present an innovative method for gathering feedback from using cutting-edge sentiment analysis techniques to the implementation of a student feedback mining system. This system's main objective is to automatically evaluate and extract emotions from student feedback,

giving teachers and educational institutions crucial knowledge about the complex facets of student satisfaction. The system uses natural language processing (NLP) to its full potential.

It sorts feedback into good, negative, and neutral sentiments by separating feelings from unstructured text data. The main elements of the suggested Student Feedback Mining System are discussed in this paper, including the thorough gathering of input from several sources such as discussion boards and online surveys. It highlights how crucial text preparation is to removing noise and standardizing data formats, which makes analysis more effective. Furthermore, the essay emphasizes how cutting-edge sentiment analysis algorithms are used to interpret the emotional tone of comments, enabling a more complex comprehension of students' emotions.

The classification of feedback according to particular standards, including course content, instructional strategies, facilities, and overall learning experience, is at the heart of the suggested approach. By offering a comprehensive understanding of the different factors influencing student satisfaction, this classification seeks to enable teachers to focus on certain areas in need of development. The study also emphasizes the value of data reporting and visualization in providing the evaluated feedback in an understandable manner. This facilitates a better informed decision-making process by making it simple for administrators and teachers to understand the emotions that pupils are expressing. In developing a framework for continuous improvement, this study aims to give teachers useful information from feedback analysis. The suggested system uses a data-driven methodology to help enhance curriculum design, instructional strategies, and the broader educational setting. To sum up, the sentiment analysis-based student feedback mining system described in this study presents a viable solution to the drawbacks of conventional feedback gathering techniques. The system seeks to establish a constructive and stimulating learning environment by automating the analytical process and offering real-time information, which eventually aids in the ongoing development of learning methodologies.

II. BACKGROUND

Learner-centered approaches and tactics for continuous improvement are driving a major transition in the field of education. The gathering and evaluation of student feedback is a key component of this evolution since it provides educators and institutions with important information to raise the standard of instruction. Low response rates, delayed feedback processing, and subjective interpretation are some of the drawbacks of using conventional feedback collection techniques like surveys and assessments. In order to overcome these obstacles, there is increasing interest in utilizing cutting-edge technology, particularly sentiment analysis and natural language processing (NLP), to expedite the feedback gathering procedure and extract more profound insights from the vast volume of unstructured text data that students submit. The goal of sentiment analysis, a branch of natural language processing, is to identify the sentiments and sentiments that are conveyed through spoken or written language.

Sentiment analysis provides a more sophisticated picture of student perceptions by automatically classifying sentiment in student input as positive, negative, or neutral. Many studies have emphasized the potential of sentiment analysis in an educational setting, demonstrating its applicability in a number of domains, including institutional feedback analysis, teacher evaluation, and course evaluation. The development and use of sentiment analysis in educational research was further expedited by the introduction of machine learning methods and the accessibility of massive data sets. By offering a thorough and automated method of sentiment analysis in the context of student feedback, the suggested Student Feedback Mining System aims to expand upon this framework. The system seeks to address the drawbacks of human feedback processing by incorporating cutting-edge NLP techniques and offering teachers timely, data-driven insights into a range of teaching-related topics. Furthermore, as more educational institutions embrace evidence-based decision-making techniques, the system's focus on ongoing improvement is consistent with larger trends in educational research and practice. The system's capacity to classify feedback according to particular standards, like course material, instructional strategies, and equipment, improves the granularity of analysis and permits focused interventions for development.

2.1 Tokenization

Is a fundamental method of natural language processing (NLP) that divides a text sequence into smaller parts known as tokens. Depending on the task's particular requirements and context, tokens can be words, phrases, symbols, or other meaningful elements. In many NLP applications, such as sentiment analysis, machine translation, and text analysis, the tokenization procedure is essential.

2.2 Stop Word Removal

A frequent preprocessing step in natural language processing (NLP) is stop word removal, which entails removing words that don't contribute much to the communication of important information. These words, also referred to as stop words, are typically everyday words that are used frequently in the language but frequently add nothing to the overall meaning of the text. By lowering data dimensions and concentrating on more pertinent phrases, eliminating stop words can increase the effectiveness of text processing and analysis. The English words "the," "and," "is," "in," and "of" are examples of stop words.

2.3 Clustering

The technique of creating classes of related objects from a collection of abstract objects is known as clustering [4]. It is possible to treat a collection of data objects as a single group. In cluster analysis, a data collection is initially divided into groups according to data similarity, and the groups are then given labels. Clustering has the primary advantage over categorization since it is flexible and aids in the extraction of valuable characteristics that set various groupings apart.

2.4 Classification

The practice of grouping data into categories for optimal and efficient utilization is known as data categorization [4]. Finding and retrieving crucial data is made simpler with a well-thought-out data classification system. For risk management, legal research, and compliance, this can be especially crucial.

2.5 Sentiment Analysis

Sentiment analysis is the technique of locating and extracting subjective information from source materials using computational linguistics, text analysis, and natural language processing. Sentiment analysis is frequently employed in social media and reviews for a range of purposes, including customer support and marketing. Sentiment analysis seeks to ascertain a speaker's or writer's attitude toward a subject or the general contextual polarity of a document. An attitude can be defined as one's desired emotional communication, affective state, or judgment or appraisal.

III. LTITERACHAR REVIEW

The review of "Student Feedback Mining System Using Sentiment Analysis" might be reduced to emphasize a particular criterion. In the framework of the k-means clustering algorithm, let's examine the "Cluster size (k)" parameter: The number of clusters into which the student feedback data is separated is mostly determined by the cluster size parameter (k) in the k-means clustering algorithm. Optimizing the analysis and interpretation of students' emotions requires an understanding parameters.

The body of research on educational data mining and sentiment analysis offers important insights into the significance of cluster size in clustering algorithms. Research has looked into how varying values of k impact sentiment groups' granularity and, in turn, influence sentiment analysis outcomes when applied to student input. Selecting the cluster size parameter is a crucial step in the Student Feedback Mining System technique. Finding the ideal value of k is a crucial procedure that takes into account factors like evaluation metrics, cluster coherence requirements, and the overall interpretability of the findings. Different cluster sizes (k) in the clustering results show clear patterns in the sentiment clustering of student feedback. The specificity with which sentiments are organized varies depending on the value of k, which produces clusters with varying granularities. The insights obtained from the sentiment analysis process are directly impacted by this variation in cluster size.

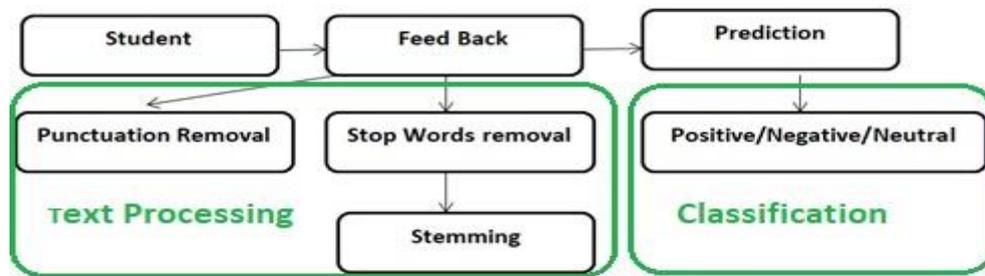


Fig.1 block diagram of proposed system

The consequences of varying cluster sizes for the understanding of students' emotions are thoroughly discussed. It examines the effects of the selected value of k on the detection of sentiment patterns, possible trade-offs, and issues related to particular cluster sizes. Understanding the subtleties of sentiment expressions and making sure the system extracts valuable insights from student feedback data depend on this analysis. The overview is improved by pointing out the drawbacks and factors related to the selected cluster sizing strategy. This offers an underutilized perspective of the parameter's function in the study by acknowledging any issues and outside influences that might influence the best choice of k . In summary, the approach emphasizes how crucial the cluster size parameter (k) is in determining the outcomes. The investigation offers important insights into how cluster size affects the granularity and interpretability of sentiment groups produced from student input by concentrating on this particular element.

IV. METHODOLOGY

The research article on "Student Feedback Mining System using Sentiment Analysis" provides a thorough methodology section that outlines the study's steps. An outline that addresses several facets of the process is provided below:

4.1 Data Collection

Indicate the sources of the student feedback information, including course evaluations, online surveys, and other feedback systems. Explain the steps involved in gathering a representative data set, including the frequency and duration of data collection.

4.2 Text Processing

Indicate the sources of the student feedback information, including course evaluations, online surveys, and other feedback systems. Explain the steps involved in gathering a representative data set, including the frequency and duration of data collection.

4.3 Sentiment Analysis

Give a summary of the methodology utilized for sentiment analysis. The machine learning model or sentiment lexicon used for sentiment classification comes next. Describe how each feedback is given a sentiment polarity (positive, negative, or neutral).

4.4 Clustering Algorithm

Provide the clustering algorithm or algorithms that were chosen to group the sentiment analysis input. Emphasize the particular clustering process parameters, paying particular attention to the "Cluster size (k)" parameter in relation to k -means or another pertinent algorithm.

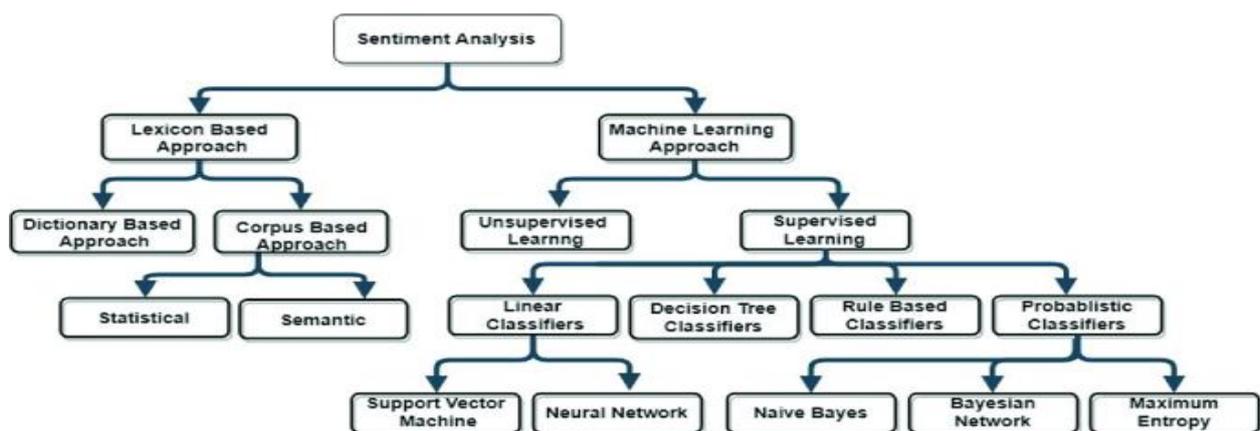


Fig.2 sentiment text preprocessing block diagram

4.5 Integration of Sentiment Analysis and Clustering

Explain the integration of sentiment analysis findings into the clustering procedure. Describe any other features or representations that are utilized to enhance the clustering of feedback data. Give an explanation of how sentiment analysis and clustering are combined to make decisions.

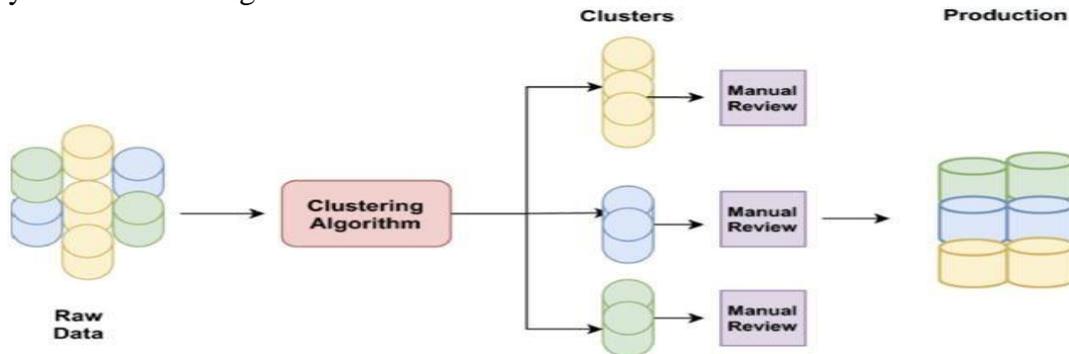


Fig.3 integration of sentiment analysis and clustering

4.6 Evaluation Metrics

Explain the metrics that are used to assess sentiment analysis and clustering performance. Discuss how the assessment metrics and the overall caliber of the results are impacted by the selection of "Cluster size (k)".

4.7 Software and Tools

Indicate which software, tools, and programming languages were used to put the methodology into practice. Name any particular frameworks or libraries that are used for data processing, clustering, and sentiment analysis.

4.8 Ethical Considerations

Talk about the moral issues surrounding the usage of student feedback data. Explain the steps taken to guarantee secrecy, privacy, and adherence to moral principles. A clear, thorough, and repeatable explanation of the design, implementation, and evaluation of the student feedback mining system should be included in the methods section.

V. EXPERIMENTS

In this work, [9]we develop a system for mining student feedback that examines subjects and attitudes in comments created by students. Students' feedback is gathered for a particular course in order to facilitate evaluation and enhance the learning portfolio. We eliminated stop words and tokenized the feedback into sentences. The feedback document's themes were taken out. The extracted themes and associated comments are displayed in the following table. These were generated as a cluster, as indicated in Table 1. The comments from each cluster are categorized as either favorable or negative, as indicated in Table 1 below.

Table 1: classifications

S.No.	Topic	Positive	Negative
1	Faculty interaction	94	6
2	Punctual	65	35
3	Lab	50	50
4	Delivery style	70	30
5	Paper correction	68	32

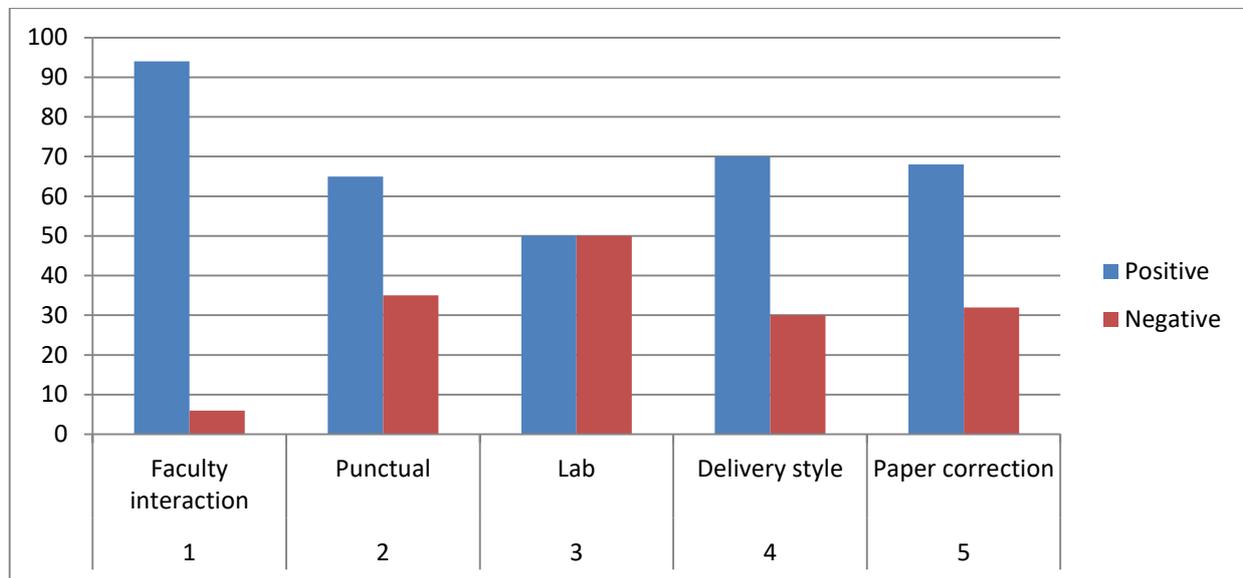


Fig.4 chart representation

VI. CONCLUSION

In order to analyze topics and attitudes from student-generated input, a student feedback mining system is developed in this study. To graphically depict students' opinions, this system employs pre-processing, topic extraction, clustering, and categorization. Both student learning and the instructional strategies of instructors will benefit from this system. List the key findings from the clustering and sentiment analysis. Emphasize the most important trends, patterns, and revelations from the data on student feedback. Talk about how the feelings and clusters that have been found give teachers useful information. Examine potential modifications or enhancements to the curriculum, instructional strategies, or other educational practices in light of the results. Think about how understanding of student comments was enhanced by the combination of sentiment analysis and clustering. Talk about how the two methods work together and how they both contribute to the overall evaluation. Be mindful of any constraints or restrictions you might run into when studying. Determine areas where the student feedback system needs to be improved and studied further. Give a brief overview of the research's importance for a deeper comprehension of students' emotions. Summarize the study's importance for enhancing teaching methods and creating a supportive learning environment in your conclusion. To ensure that readers fully comprehend the importance of the research, the "Conclusion" section should include a succinct yet thorough assessment of the advantages and ramifications of the study.

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