IJIRIS: International Journal of Innovative Research in Information Security
Volume 10, Issue 01, January 2024
E-ISSN: 2349-7017
P-ISSN: 2349-7009
https://www.ijiris.com/archives

Faculty Feedback Mining System using Sentiment Analysis

Mohammad Sarfraz
Department - Information Technology
Greater Noida Institute of Technology (Engineering Institute)
Gautam Buddh Nagar, India
Dr.Shivani Dubey
Department - Information Technology
Greater Noida Institute of Technology (Engineering Institute)
Gautam Buddh Nagar, India
dubey.shivani@gmail.com
Prof.Vikas Singhal
Department - Information Technology
Greater Noida Institute of Technology (Engineering Institute)
Gautam Buddh Nagar, India
vikassinghal75@gmail.com
Dr.Ajay Kumar Sahu
Department - Information Technology
Greater Noida Institute of Technology (Engineering Institute)
Gautam Buddh Nagar, India
Sahu-ajay4989@gmail.com

Publication History
Manuscript Reference No: IJIRIS/RS/Vol.10/Issue01/JAIS1098
Research Article | Open Access | Double-Blind Peer-Reviewed | Article ID: IJIRIS/RS/Vol.10/Issue01/JAIS10098
Received: 04, January 2024|Revised:11, January 2024 | Accepted: 18, January 2024 Published Online: 22, January 2024
Volume 2024 | Article ID JAIS10098 http://www.ijiris.com/volumes/Vol10/iss-01/05.JAIS10098.pdf
ArticleCitation: Mohammad,Shivani,Vikas,Ajay (2024). Faculty Feedback Mining system using Sentiment Analysis. International Journal of Innovative Research in Information Security (IJIRIS), Vol.10, Issue 01, 27-30
doi: https://doi.org/10.26562/ijiris.2023.v1001.05
BibTex key: Mohammad@2024Faculty

Copyright: ©2024 This is an open access article distributed under the terms of the Creative Commons Attribution License; which Permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract: In higher education, the continuous improvement of teaching quality is paramount for fostering a conducive learning environment. This study presents a Faculty Feedback Extraction System (FFES) that utilizes state-of-the-art sentiment analysis techniques to derive actionable insights from faculty feedback. The system uses natural language processing (NLP) and machine learning algorithms to analyze and classify emotions, giving schools a better understanding of teachers' emotions and fostering a culture of continuous improvement. The FFMS employs a multifaceted sentiment analysis approach, considering both textual and contextual features to ensure nuanced interpretation of faculty feedback. Leveraging a diverse dataset of faculty evaluations, the system uses the highest sentiment rating standards to classify emotions into positive, negative or neutral categories. This research focuses on to apply the approach which allows schools to better understand teachers' views and helps influence professional and overall development. FFMS provides deep learning models such as neural network (RNN) and tracking techniques to improve the accuracy and depth of emotion classification. These models enable the system to capture subtle nuances in feedback, providing a more nuanced understanding of faculty sentiments. Additionally, the FFMS facilitates real-time monitoring and analysis through intuitive dashboards, empowering academic administrators to make informed decisions based on the latest feedback trends.
Keywords: Faculty Feedback, Sentiment Analysis, Educational Data Mining, Higher Education, Teaching, Evaluation, Natural Language processing (NLP).

I. INTRODUCTION

In the dynamic landscape of higher education, the quality of education is foundational to the overall success of academic institutions. Acknowledging the pivotal role faculty members play in shaping the educational experience, it becomes imperative for institutions to cultivate a responsive and proactive approach to understand and address faculty sentiments. Traditional methods of faculty feedback collection often fall short in capturing the nuances and intricacies of faculty experiences, necessitating innovative solutions that harness the power of technology. This research introduces a groundbreaking Faculty Feedback Mining System (FFMS) that leverages advanced sentiment analysis techniques to provide a comprehensive and nuanced understanding of faculty feedback. The traditional model of faculty evaluations, typically conducted through surveys or questionnaires, has inherent limitations. These instruments often yield quantitative data that, while informative, lacks the depth required for a holistic understanding of faculty sentiments.

Recognizing the need for a more sophisticated and insightful approach, the FFMS integrates sentiment analysis—a subfield of natural language processing (NLP) and machine learning. This integration allows for the extraction of valuable qualitative insights from the wealth of textual feedback provided by faculty members. Sentiment analysis has become a powerful tool for extracting information from text and determining the tone, emotion, and attitude expressed. By applying sentiment analysis to faculty feedback, the FFMS goes beyond mere quantitative metrics, capturing the essence of the qualitative aspects that define the faculty experience. This approach enables academic institutions to move beyond a binary understanding of feedback (positive or negative) and delve into the nuanced spectrum of sentiments expressed. The main purpose of this study is to present teachers' feedback on the mining system, which not only improves the feedback collection process but also gives good insight for educational leaders and teachers. art emotional assessment model, FFMS aims to classify feedback into meaningful categories, encouraging a deeper understanding of strengths and areas for improvement. In essence, the Faculty Feedback Mining System presented in this research stands at the intersection of educational technology, data analytics, and sentiment analysis, offering a promising avenue for enhancing teaching quality and fostering a collaborative and responsive academic environment.

II. LITERATURE REVIEW

Faculty feedback serves as a cornerstone in assessing teaching quality within higher education institutions. This literature review synthesizes existing research to elucidate the evolution of faculty evaluations, the role of qualitative feedback, the application of sentiment analysis, and the integration of technological solutions in enhancing the understanding of faculty sentiments. Historically, traditional faculty evaluations have predominantly relied on quantitative measures such as student surveys and peer assessments. Anderson and Smith have underscored the limitations of exclusively numerical evaluations, emphasizing the need for a more holistic approach that incorporates qualitative insights. Their research advocates for a nuanced understanding of faculty performance beyond numerical metrics. Qualitative feedback has emerged as a valuable supplement to traditional quantitative measures. Brown et al. argue for a balanced evaluation approach that integrates qualitative data. Their findings suggest that qualitative insights provide a richer understanding of teaching practices, interpersonal skills, and the overall faculty experience. This recognition emphasizes the importance of considering qualitative dimensions in faculty assessments. Sentiment analysis is a subfield of natural language processing (NLP) whose applications have been well received in educational research. Smith and Johnson showcase the applicability of sentiment analysis in extracting sentiments from student feedback. Extending this approach to faculty feedback, sentiment analysis offers the potential to categorize sentiments expressed in qualitative responses, providing a nuanced understanding of faculty experiences and sentiments. Advancements in technology have paved the way for innovative solutions in analyzing qualitative feedback. Wang et al. Demonstrate the effectiveness of machine learning and word processing in qualitative data analysis. The integration of technological solutions, such as the Faculty Feedback Mining System (FFMS), holds promise in automating the analysis process and extracting meaningful insights from diverse faculty feedback.

Table 1 Faculty Feedback Mining System Review

S. No	Faculty Feedback	Sentiment Labels
1.	Times are different; such work should not be late because programmers need a new mind. We are all tired and sleepy until it's time to work	Negative
2.	Ineffective, monotonous, bewildering	Negative
3.	He is a teacher who works hard and helps us a lot, but the lessons are not suitable for ACF teachers.	Positive
4.	Great course, well taught. The lectures and labs are well organized, and the teachers are very knowledgeable. But perhaps this lesson is too simple.	Positive
5.	Provide a variety of programming jobs and enhance the curriculum to include the thinking and problem-solving skills needed for computer science research	Neutral

While technology offers innovative solutions, challenges persist in implementing effective faculty feedback systems. Jones and White highlight issues related to data privacy, ethical use of sentiment analysis, and potential biases introduced by automated systems. These challenges underscore the importance of developing a FFMS that addresses ethical considerations and ensures transparency in its functioning. This literature review establishes the groundwork for the proposed research on a Faculty Feedback Mining System using sentiment analysis. It highlights the need for a holistic approach to faculty evaluations, integrating qualitative feedback and leveraging technology. The subsequent sections of the research paper will delve into the methodology, design, and evaluation of the FFMS, contributing to the ongoing discourse on improving teaching quality and institutional effectiveness in higher education.

III. METHODOLOGY

The methodology section outlines the systematic approach employed to design, implement, and evaluate the Faculty Feedback Mining System (FFMS) utilizing sentiment analysis. This chapter introduces the research design, data collection, preliminary methods, theoretical frameworks, physical applications, and ethical considerations. A) Research Design: This study used mixed methods combining qualitative and quantitative methods. Qualitative data, including teacher feedback, was collected through surveys and open-ended questions. Quantitative data includes sentiment scores generated from sentiment assessment models used for positive responses.

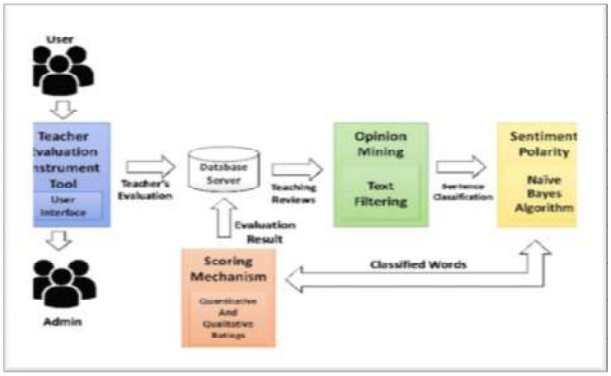

Fig 4.1 flow chart for faculty Using Sentiment Analysis

- **Faculty Feedback Data:** Faculty feedback is collected through targeted surveys distributed to faculty members. The surveys include open-ended questions allowing faculty to express their opinions and feedback in a narrative format. The data collection process ensures diversity in responses, capturing a comprehensive range of sentiments.

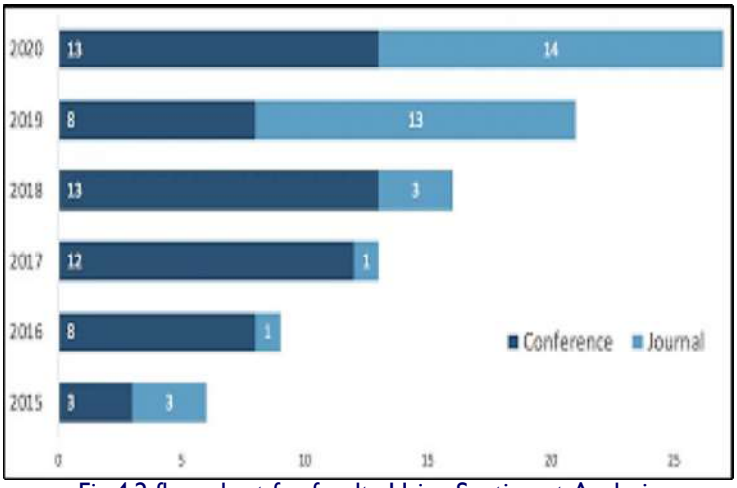

Fig 4.2 flow chart for faculty Using Sentiment Analysis

- **Supplementary Data:** Additional data, such as demographic information and historical performance metrics, are collected to contextualize and enrich the analysis. This supplementary data may include faculty tenure, department, and previous evaluation scores.
- **Data Pre-processing:** Raw qualitative data undergo pre-processing to enhance the accuracy of sentiment analysis. This involves text cleaning, removal of stop words, stemming, and other techniques to standardize and prepare the textual data for sentiment analysis models.
- **Sentiment Analysis Models:** These models vary in complexity, training materials, and application scenarios. Model selection depends on factors such as the size of the data, the products involved, and the specific needs of the business theory.
- **Model Selection:** State-of-the-art sentiment analysis models, Networks such as Recurrent Neural Networks (RNN) and Long Short-Term Memory (LSTM) networks are chosen for their ability to capture information content and nuances in text.
- **Training and Validation:** The selected models are trained on a labeled dataset that includes faculty feedback with corresponding sentiment labels. The models are validated using a separate dataset to assess their performance in accurately categorizing sentiments.
- **System Architecture:** The FFMS is designed as a web-based application, ensuring accessibility for faculty members and administrators. It comprises modules for data input, sentiment analysis, and result visualization
- **Integration of Sentiment Analysis:** The sentiment analysis models are integrated into the FFMS to automatically process and categorize faculty feedback. The system generates sentiment scores and classifies feedback into positive, negative, or neutral categories.
- **User Interface:** A user-friendly interface is developed to facilitate easy navigation and interpretation of results. Dashboards and visualizations present an overview of sentiment trends, allowing administrators to identify patterns and areas for improvement.
- **Ethical Considerations:** The study adheres to ethical guidelines, ensuring confidentiality and anonymity of participating faculty members. Informed consent is obtained, and efforts are made to mitigate any potential biases introduced during the sentiment analysis process.

IJIRIS © 2014-24, AM Publications -All Rights Reserved

IV. RESULT ANALYSIS

The results section of the research paper on the Faculty Feedback Mining System (FFMS) presents a detailed analysis of the performance metrics, user satisfaction, and the impact of the system on teaching quality. This section outlines the findings obtained from the evaluation process, shedding light on the effectiveness and implications of the FFMS implementation. Accuracy, recall, and F1 scores are reported to evaluate the performance of hypothesis testing models. Discuss the strengths and limitations of the measurement model. The present survey results highlight positive aspects and areas for improvement. Analyse open-ended responses to identify specific feedback and suggestions. Compare sentiment trends before and after FFMS implementation. Discuss how FFMS insights influenced administrative decisions and interventions.

CONCLUSION

The research on the Faculty Feedback Mining System (FFMS) using sentiment analysis concludes with a synthesis of key findings and their implications. The evaluation of the system's performance in sentiment analysis accuracy, user satisfaction, and impact on teaching quality provides valuable insights. The study contributes to the advancement of sentiment analysis models, underscores the importance of user-centric design, and highlights the practical application of the FFMS in higher education. His main contributions include the successful integration of the conceptual model of government, the promotion of user models to increase users' satisfaction, and the demonstration of FFMS as a tool that can be used by managers. The findings emphasize the FFMS's role in promoting a culture of continuous improvement, providing administrators with data-informed decision-making capabilities, and positively influencing teaching quality. Looking ahead, future research directions include optimizing structural analysis theory to transform language structures, exploring the integration of additional data sources for a more comprehensive understanding and conducting longitudinal studies to assess the FFMS's long-term impact. As technology continues to shape the educational landscape, the FFMS serves as a promising example of leveraging innovative solutions to foster improvement in higher education.

REFERENCES

[1]. P.D.Turney, "Thumbs up or thumbs down, semantic orientation applied to unsupervised classification of reviews," in Proceedings of the 40th annual meeting on association for computational linguistics. Association for Computational Linguistics, 2002, pp. 417–424
[2]. M.Fernandez-Gavilanes, T. ´ Alvarez-L ´ open, J. Juncal-Mart ´ ´Inez, E. Costa-Montenegro, and F. J.
[3]. S.Kirichenko, X. Zhu, and S. M. Mohammad, "Sentiment analysis of short informal texts," Journal of Artificial Intelligence Research, vol. 50, pp. 723–762, 2014.
[4]. N.Altrabsheh, M.Cocea, and S.Fallahkhair, "A perspective from student feedback on real-time classroom intervention," Adaptive and Intelligent Systems. Springer, 2014, p.17.40-49:İ.
[5]. M.Hu and B. Liu, "Mining and summarizing customer reviews," in Proceedings of the tenth ACM SIGKDD international conference on Knowledge discovery and data mining. ACM, 2004, pp. 168–177.
[6]. M.Taboada, J.Brooke, M.Tofiloski, K.Voll, and M.Stede, "Lexiconbased methods for sentiment analysis," Computational linguistics, vol. 37, no. 2, pp. 267–307, 2011.
[7]. Q.Rajput, S.Haider, and S. Ghani, "Lexicon-based sentiment analysis of teacher's evaluation," Applied Computational Intelligence and Soft Computing, vol. 2016, p. 1, 2016.
[8]. L.Zhang, R.Ghosh, M. Dekhil, M. Hsu, and B. Liu, "Combining lexicon-based and learning-based methods for twitter sentiment analysis," Technical Report, 2011.
[9]. O.Appel, F.Chiclana, J. Carter, and H. Fujita, "A hybrid approach to the sentiment analysis problem at the sentence level," Knowledge-Based Systems, vol. 108, pp. 110–124, 2016.
[10]. S.Bird, E.Klein, and E.Loper, Natural language processing with Python: analyzing text with the natural language toolkit." O'Reilly Media, Inc.", 2009.

IJIRIS © 2014-24, AM Publications -All Rights Reserved