

Evaluating Teachers' Performance through Aspect-Based Sentiment Analysis

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Abstract—This research demonstrates a novel approach for evaluating teacher performance by conducting aspect-based sentiment analysis (ABSA) on student feedback. A large dataset of over 2 million student comments about teachers is analyzed using cutting-edge natural language processing and customized deep learning techniques. The methodology involves identifying positive, negative and neutral aspects of teaching using a BiLSTM model. Rigorous preprocessing, domain adaptation, and performance metrics ensure a robust and objective evaluation. The granular, nuanced insights obtained through this aspect-level sentiment analysis enable educational institutions to provide targeted and unbiased feedback to teachers on their strengths and areas needing improvement. Moreover, this work lays the foundation for detecting potentially fraudulent reviews in academic settings – a crucial capability for safeguarding assessment integrity. The detailed aspect-based analysis methodology presented here significantly advances subjective and holistic evaluation practices. This research has far-reaching implications for enriching teacher development while upholding the credibility of performance assessments through sentiment analysis innovations.

Index Terms—Feature extraction, Fraud reviews, Fraud review in academic settings detection, Teacher Performance evaluation, Deep learning, Aspect based sentiment analysis

I. INTRODUCTION

In modern education, assessing teacher performance through student feedback carries immense significance. This research focuses primarily on Aspect-Based Sentiment Analysis (ABSA) as a powerful tool for dissecting teacher performance while establishing the groundwork for detecting fake reviews and ratings. By harnessing advanced natural language processing techniques and deep learning models, this study seeks to elevate the precision and objectivity of teacher performance

evaluations, setting the stage for future endeavors to ensure the authenticity and reliability of educational assessments through sentiment analysis.

Modern methodologies for evaluating teacher performance often rely on subjective assessments and holistic sentiment analysis, but they may fall short in addressing the challenge posed by fake reviews and ratings. This research advocates adopting ABSA as a foundational framework to address this concern. ABSA's ability to dissect sentiment on a granular level enhances teacher performance assessments and lays the groundwork for safeguarding the integrity of reviews and ratings in educational contexts. To implement ABSA for teacher performance evaluations, this study introduces an innovative model that underpins the research's core objectives. This model seamlessly integrates deep learning, specifically Long Short-Term Memory (LSTM) networks, and augments sentiment analysis through a random forest classifier. Furthermore, it incorporates aspect selection and domain specificity, providing the adaptability and precision required to lay the foundation for detecting fake reviews and ratings.

While the primary thrust of this research is to provide educational institutions with a robust instrument for comprehensive teacher performance assessment, it concurrently paves the way for ensuring the credibility of reviews and ratings. According to the Spiegel Research Center [1], over 90% of consumers consult online reviews before making a purchase. After researching evaluations on several e-commerce sites, authors in [2] found that more than ten percent of reviews on e-commerce sites are fraudulent. ABSA not only delivers detailed evaluations of teacher performance but also anticipates